March 1984

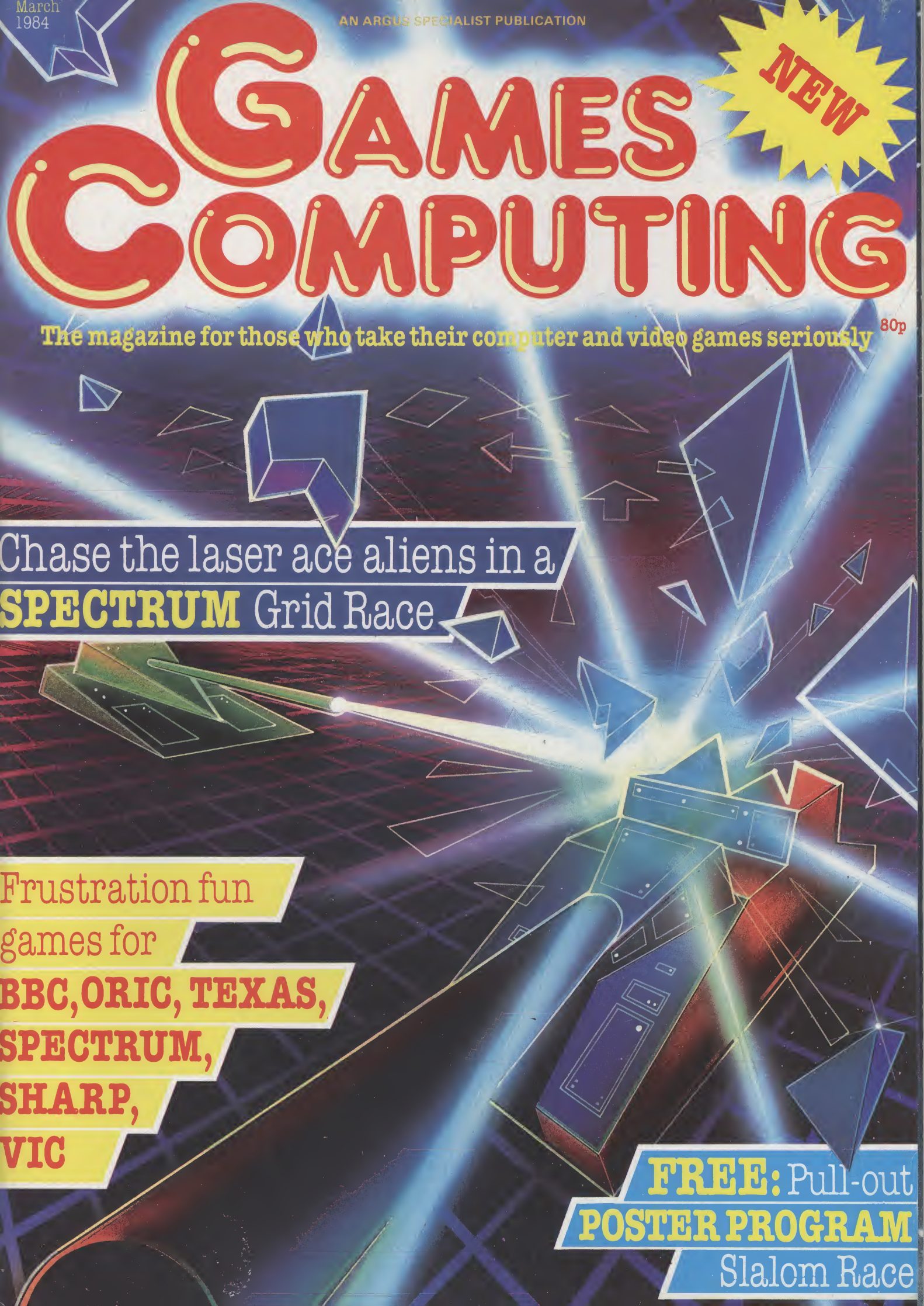
AN ARGUS SPECIALIST PUBLICATION

GAMES COMPUTING

NEW

The magazine for those who take their computer and video games seriously

80p



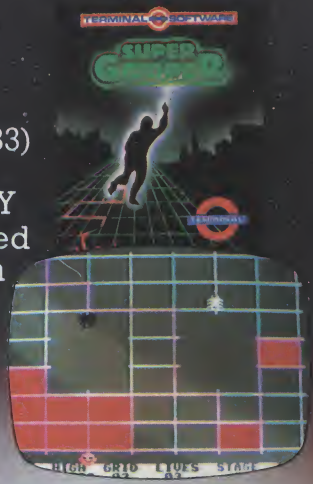
Chase the laser ace aliens in a **SPECTRUM** Grid Race

Frustration fun games for **BBC, ORIC, TEXAS, SPECTRUM, SHARP, VIC**

FREE: Pull-out **POSTER PROGRAM** Slalom Race

TERMINAL SOFTWARE

commodore 64 games cassettes



SUPER SKRAMBLE!
Personal Computer News (15-21 Sept '83) gave SUPER SKRAMBLE! an overall rating of NINETEEN OUT OF TWENTY and described it as: "Well implemented with beautifully smooth scrolling and very nice graphics."

SUPER GRIDDER
"... a compelling piece of frivolity that could give hours of fun." was the verdict of Personal Computer News (22-28 Sept '83).





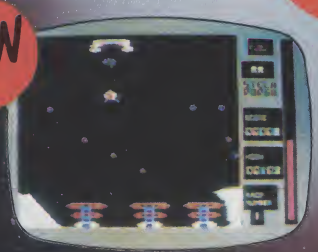
SUPER SKRAMBLE!
"An excellent game" said Computer & Video Games magazine (Sept '83).

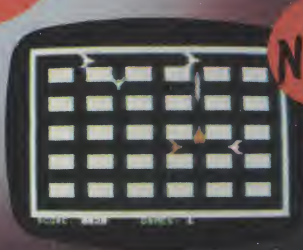
SUPER DOGFIGHT
The first 64 games cassette to have SIMULTANEOUS TWO-PLAYER ACTION – realistic sound effects too.

TERMINAL

NEW

STELLAR DODGER
A game of skill and anticipation in which you must dodge your way through asteroids to complete your mission.





NEW

HUNTER
A fast action game in which your pursuers gain in speed and intelligence as you master each successive screen.

sinclair Spectrum 48k

VAMPIRE VILLAGE and **SPACE ISLAND** are REAL-TIME graphic adventures and every game is different from the one before.



CITY is a unique REAL-TIME better-than-a-board game for 1-4 players that combines simplicity of use with complexity of form as the city you build takes on a life of its own.



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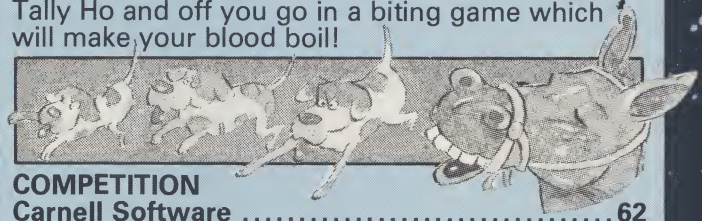
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Software Assistant Simon Rockman
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Assistant Advertisement Manager Julie Bates
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More WINNING GAMES from LYVERSOFT

A team of research scientists are trapped on the moon and you have to pilot the rescue pod from the mother ship and ferry them back safely. But you have only space for one scientist at a time. 100% M/C action with super smooth HI-RES GRAPHICS AND JOYSTICK OPTION.

This game tests your aim and reactions as you command a gunsight on a homeward bound space freighter. Your cargo is the royal treasures of the empire and many people want them. A machine code presentation that should have you hooked.

Based on the popular arcade game Pheonix. This 100% full colour epic pitches you against the evil Albertrons who are set to destroy your race, five levels of fast action bring you to the command centre of battle fleet, can you finish the job. WITH JOYSTICK OPTION.

Using M/C graphic routines, a game to absorb the keen novice and the scratch player. Play on a 9 or 18 hole course, with full selection of clubs. Along the greens and fairways hours of addictive sport can be had.

With HI RES graphics and M/C. You are set the problem of putting the picture back together. Test your skill against the dragon 32 computer. A game guaranteed to hold you spell bound for hours.

In a change of tactics the beings beyond the stars have developed an android of human form to do their dirty work. And with the aid of sensor jamming they may prove formidable. Using full colour, M/C, hi-re graphics this game can offer up to 21 levels of combat.

The mission is simple, but its completion is far from being so. As captain of starship you have all the best facilities at your disposal. Unfortunately the klingons oppose you. A great M/C version of this classic computer game.

A riveting, full colour graphic adventure. That pits you against the spells and guardians of the tomb. In your quest to uncover the treasure of the pharoahs. This game will have you enthralled.

Evil baron von fritz is out to kill his cousin, the much loved Prince Rupert. The Baron intends to throw the prince from his plane into the sacred fire pit. But you the eagle of the north will make every endeavour to save your friend Prince Rupert. With colour, sound, this M/C game is a must.

ALSO AVAILABLE:

Demon Driver Basic VIC20 — £5.95
Lunar Rescue Basic VIC20 — £5.95
Apple Bug/Crazy Climber Basic VIC 20 — £5.95
Nuclear Attack/Grand Prix Basic VIC20 — £5.95
Hearts & Diamonds/Hi-Lo Basic VIC20 — £5.95
Machine Code Monitor VIC20—£14.95

all games £5.95

LUNAR RESCUE (48K Spectrum) @ £5.95 each
GOLF (48K Spectrum) @ £5.95 each
VOYAGER (VIC20 8 or 16K) @ £5.95 each
LIBERATOR (16K/48K Spectrum) @ £5.95 each
PICTURE PUZZLE (Dragon 32) @ £5.95 each
SPHINX (VIC20 8 or 16K) @ £5.95 each
THUNDERHAWK (48K Spectrum) @ £5.95 each
ANDROID INVADERS (Dragon 32) @ £5.95 each
BIRD OF PREY (BASIC VIC20) @ £5.95 each

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AN ARGUS SPECIALIST PUBLICATION

Personal Computing Today

MARCH 1984

80p

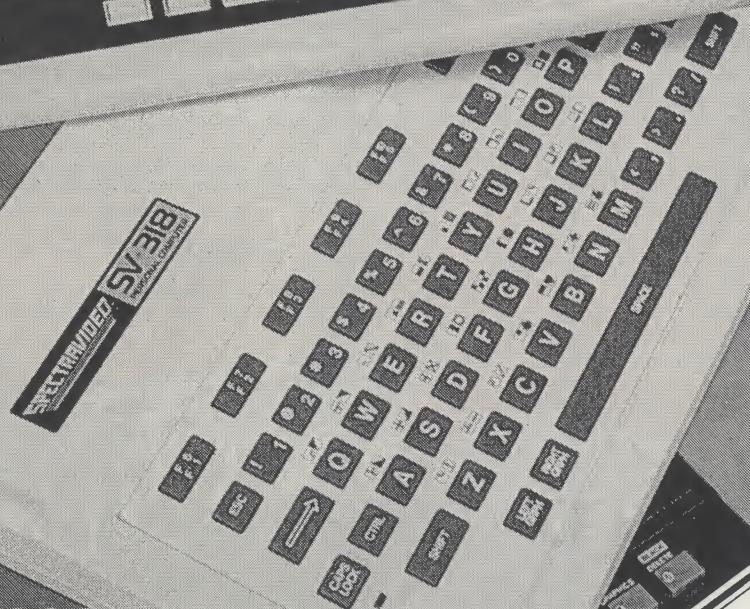
Hardware Factfile

The easy way to word process on your computer

Type useful spelling aids and programs for Electron, Oric, BBC, CBM 64

£200 Spectravideo games machine unmasked







news



Try your hand at being an Orwellian Big Brother with Incentive Softwares new simulation game "1984".

This game puts you in charge of the British economy at the start of 1984. Data is in the computer based on 1982/83 trends to give an accurate representation of the economy as of now.

The program was written by a leading expert in economics so that the economic model is as accurate as possible.

Various options are open to you for changing the situation, raising taxes, cutting old age pensions, child benefit and anything else you care to do. 10 indicators to show you your progress, unemployment, inflation and Dollars against Sterling. Each one of these indicators are represented by a graph for easy viewing.

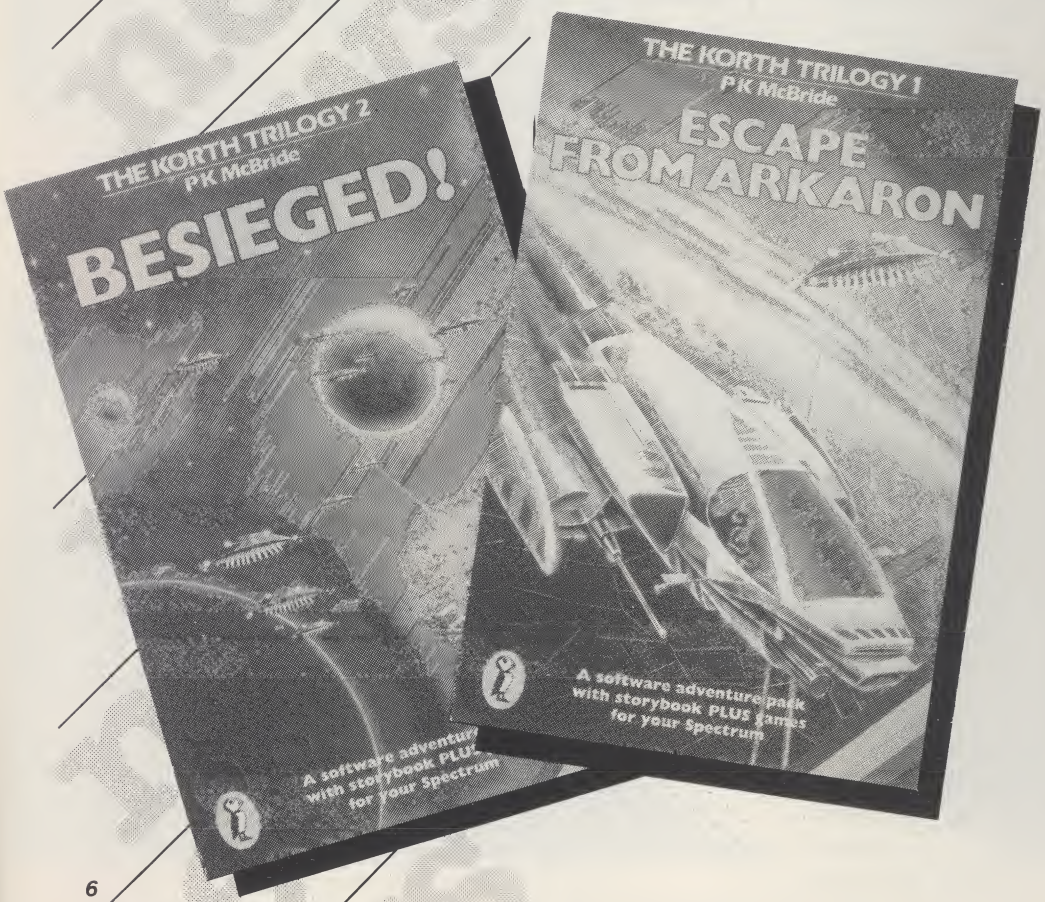
The instruction booklet of 14 pages is modestly entitled "A Pocket Guide To Running Britain". The game costs £5.50 and is for the 48K Spectrum although a BBC 'B' version is on its way. The data is to be updated every sixmonths for accuracy, and there may even be a "1985" so watch this space for more news.

Incentive Software is located at 54 London Street, Reading RG1 4SQ.

New Penguin Programs

Penguin has just released four new software packs in their Puffin Personal Computer Collection.

The packs consist of a book and a tape of programs for the ZX Spectrum.



For younger users there is the Korth trilogy, which is about a group of people trying to save the world from the Korth empire.

At various points in each book the reader is asked to refer to the programs on tape. There are three programs on each tape, each program is different in design so they are all not 'zap' games.

The programs are interrelated and pick up on certain events in the story, such as a lunar landing program. The stories are Sci-Fi based suitable for seven to ten year olds.

The Warlock of Firetop Mountain was a best selling childrens book with over 250,000 copies sold. So you've read the book, now play the video game.

Coming as a package with the tape and the book, or just the tape if you already have the book, the tape contains a maze game in which you alter ego running around a maze with only a sword and a few arrows to protect him.

On your travels around the maze you must kill monsters and pick up keys. When 15 keys have been found you can have the final conflict with the Warlock. The software is of the same theme as the book but is an independent program in its own right.

The Korth Trilogy, Escape from Arkaron, Into the Empire, and Besieged!, retail at £4.95 each. The Warlock of Firetop Mountain costs£6.95 including the book and £5.50 for the tape alone.

Penguin Books can be reached at 536 King's Rd, London SW10 0UH.

Quick Byte Coup

Two top games software houses recently joined forces in a special pre-Christmas venture.

The venue was London's prestigious Hilton Hotel where the two firmshosted a formal dinner, but things were not all they seemed. Rumours were rife that the two companies involved were to announce the formation of a nationwide chain of fast-food shops to be called 'Quick Byte'!

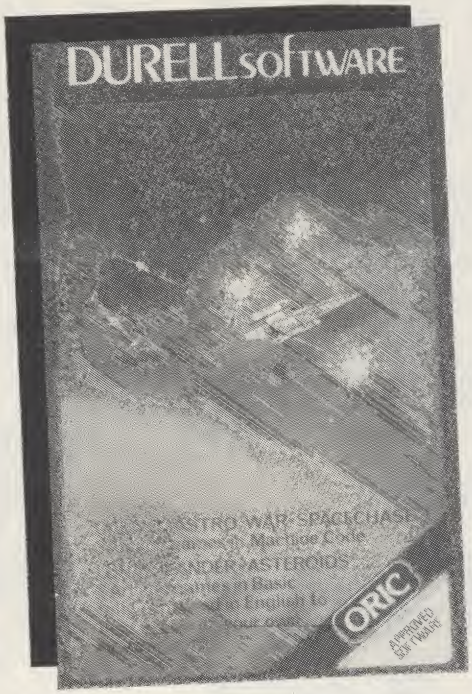
But instead it turned out that Quicksilva and Bug-Byte pulled a fast one on the press and software industry alike. The 'do' was an award ceremony for computer publications, journalists and software firms. Really it was just one big joke but by all accounts everybody by a whale of a time and took the awards in good spirit — probably quite literally! When you read the list of awards you'll see that some of them aren't complimentary at all.

And we're proud to say that the publishers of this magazine were not left out of the action, nor indeed were some of the firm's employees!

Here is a complete list of all winners and nominees, the winners name follows the category and any other nominee follows after that.

Program of the year: The Hobbit, Jet Pac, any flight simulator.
Best Advertising: Brainwave, Mijid, the Northern Computer Fair. N.B. this year Brainwave was cancelled!
"Surely you can see the benefits?"
Salesperson of the year: Beverly McNeil of ASP. Rodney Holland of Currah, the publishers of Home Computer Weekly.
Worst Dresser: Pete Neill and Chris Holland of Salamander Software. Paul Liptrot editor of Home Computing Weekly, Tim Langdell of Softek.
"Ain't it cute": Artic's lorry logo. Psion's Horace, Cuthbert from Microdeal programs.
Grubby Award: Home Computing Weekly for its front page pictures of girls. Oric for its team of sales girls, Computers for All for its girls in leopard skin leotards at shows.
The most Awesome Use of the Word Awesome Award: Jeff Minter of Llamasoft.
Most Original Program: All programs by Interceptor Micros, Ocean's Mr Wimpy.
Boob of the Year: Softek for printing a 1983 calendar for 1984. Texas Instruments, New Brain, Jupiter Ace, Acme for advertising games without saying which computer they ran on.
Paranoid Award: Neil Johnson of Microdealer UK.
Media Buying Award: Imagine for spending untold millionsin regional news advertising, Anirog for advertising on Channel 4, Artic for advertising on Grampian and Yorkshire TV.
Golden Gob Award: Paul Liptrot, editor of HCW (again!). Rodney Holland, anyone from Norway.
"Feel the Width" Award: Nick Alexander of Virgin Games.

The awards themselves were busts of Sir Clive Sinclair and were consequently called "Clives" except the "Golden Gob Award" which was a large open mouth on a plynth.



More For Young Money

Durell Software has taken a revolutionary step in its new software packaging in the form of games listings which are fully anotated with REM statements that actually explain how the program was written and how to write your own similar games.

Durell's managing director Robert White, who is a qualified teacher, explained that when Durell first started in business the two games in question, Lunar Lander and Asteroids, were released separately but they only sold about 1000 copies due to software buyers having an aversion to educational software and BASIC programs.

The new tape, Galaxy 5, has five games on it. Two of them are BASIC instruction games and three pure machine code arcade games.

In this way the buyer is attracted by the arcade games but can then learn something from the basic games.

The arcade games are Galaxy, which is a galaxian type game, Astro War, a space version of Durell's best selling Harrier Attack, and space chase, which is a part of one of their other games as well.

Galaxy 5 costs £6.95 it runs on the 16K Oric-1. You can contact them at Castle Lodge, Castle Green, Taunton TA1 4AB.

A New Gem for Lynx

Gem Software has expanded its Lynx range with two new arcade games.

Spanner Man is a 'Felix in the Factory' type of game, where Pete the Plumber has to fix leaking pipes in his boiler room before he gets flooded.

Oh Mummy!! is a painting game where doomed archeologists run around a burial chamber. The burial chamber is a grid of boxes, which you must surround in order to reveal their contents. Mummies chase you around the screen and try to exact their revenge.

Both games are written in machine code and really show what the graphics of the Lynx is capable of. This is mainly because Gem wrote their own operating software to drive the screen.

Both games sell at £7.95 and Gem is at The Maltings, Sawbridgeworth, Herts.

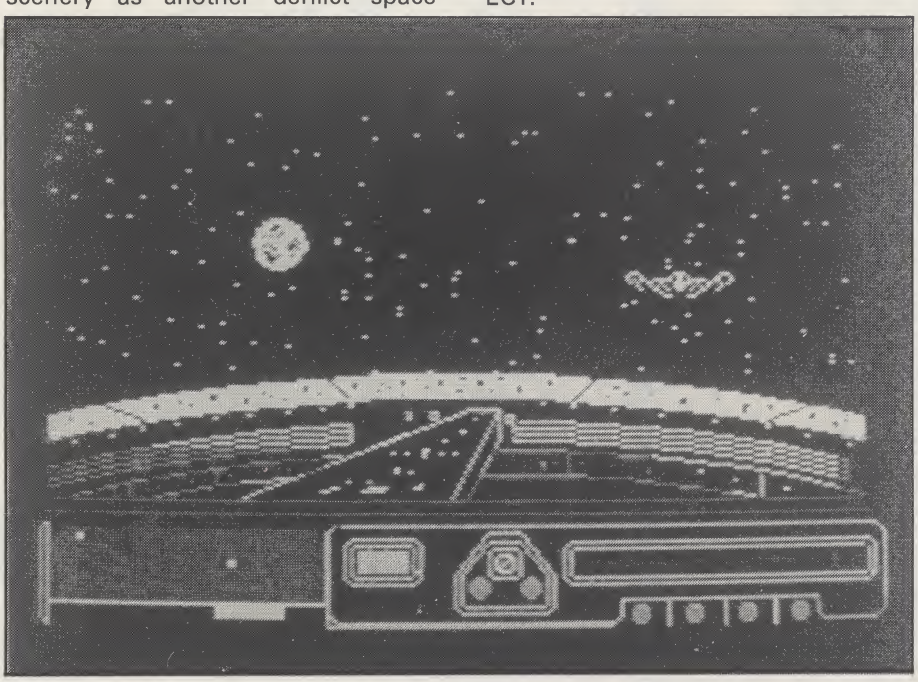
Stand By For Beyond

Space Station Zebra for the 48K Spectrum is new out from Beyond Software. The scenario is of a damaged space station under attack by a customary bunch of alien hordes.

The station can be rotated to point in any direction, and the graphics feature a moving background with such scenery as another derilict space station, planets, and various stars.

A radar screen and other instruments display your status, energy remaining, speed, direction, and ready to fire. The radar screen is particularly useful as it shows when the bad guys are near you and your ship.

Space Station Zebra costs £5.95, and is available from Beyond Software, Durrant House, 8 Herbal Hill, London EC1.



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ATTENTION ALL TOP PROGRAMMERS ! !

YOUR BEST AND ONLY THE BEST MACHINE CODE GAME PROGRAMS FOR COMMODORE 64 — VIC 20 — B.B.C. AND SPECTRUM.

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At last, a magazine that gets to the core of it.



As the proud owner of an Apple, you know that really helpful magazines don't grow on trees.

But now there's Orchard Computing. Orchard is a brand new quarterly put together specifically to suit the Apple user.

It brings you the very best in useful routines, business and games software.

And not a word of it that isn't directly relevant to you.

So if you like an Apple a day, take Orchard quarterly.

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JUST AROUND THE CORNER, A NEW R



BLACK CRYSTAL

The Classic, six program adventure game for the 48K Spectrum and 16K ZX-81 computers. No software collection is complete without it.

"BLACK CRYSTAL is an excellent graphics adventure and a well thought out package" (Sinclair User, April '83).

"BLACK CRYSTAL has impressed me by its sheer quantity and generally high quality of presentation. I am afraid I have become an addict" (Home Computing Weekly, April '83).

SPECTRUM 48K 180K of program in six parts . . . only £7.50
ZX-81 16K over 100K of program in seven parts . . . only £7.50

Why pay more for less of an adventure?



ZX-81 COMPENDIUM

Alien Intruder, Wumpus Adventure, Numerology, Hangman, Hieroglyphics, Movie Mogul.

The ideal software package for all 16K ZX-81 owners. Six major programmes on two cassettes for only £6.50.

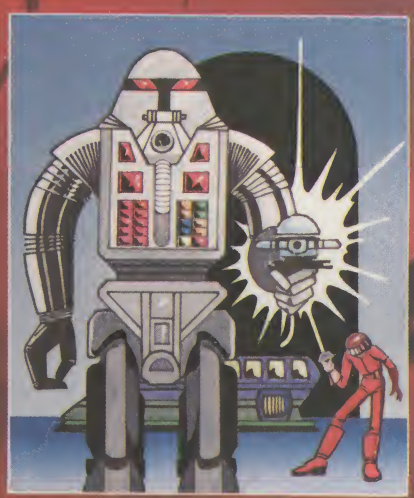
"Alien Intruder/Hieroglyphics — Both programs make good use of graphics and words to make a very entertaining package." (Sinclair User, Aug '82)

"Alien/Hieroglyphics/Wumpus/Movie — A varied mix from Carnell, all featuring imaginative responses and graphics and all of them good games for all ages (Hieroglyphics is particularly good for children)." (Popular Computing Weekly, Aug '82)



THE ADVENTURES OF ST. BERNARD

An exciting, fast moving, machine code, arcade game where you guide your intrepid St. Bernard through the perils of the icy wastelands to rescue his Mistress from the clutches of the abominable snowman. 48K Spectrum £5.95.



STARFORCE ONE

Take on the robot guardians of the central computer in a superbly stylised three dimensional battle game. 48K Spectrum £5.95.

(100% MACHINE CODE ARCADE ACTION)



THE CRYPT
written by Stephen Renton

Prepare yourself for the many challenges that shall confront you when you dare to enter "THE CRYPT".

You will battle with giant scorpions, Hell spawn, Craners, Pos-Negs and if you are unlucky enough — the Dark Cyclops in this arcade style adventure.

Available now for the 48K Spectrum @ £4.95



THE DEVIL RIDES IN

I uttered the last incantations as the clock struck thirteen. All fell silent except for a faint rustling in the corner. From out of the shadows they came, all Hell's fury against me but I was not defenceless until the Angel Of Death, astride a winged horse, joined the battle. Avoiding his bolts of hell fire, I took careful aim. My chances were slim, but if my luck held . . . 48K Spectrum £5.95.

(Fast moving, machine code, all action, Arcade game)

RANGE FROM CARNELL SOFTWARE



COMING SOON

"THE WRATH OF MAGRA"

The first born has been destroyed. The Black Crystal of Beroth has been banished. The alliance of Evil has been defeated by the armies of Lord Fendal. So ends the Third Age. Now we invite you to write your name in the history of the Fourth Age of the Third Continent.

You will meet friends and enemies, old and new, in the long awaited sequel to Volcanic Dungeon. Using high resolution graphics and combining the best qualities of "Black Crystal" and "Volcanic Dungeon", we will allow you to become part of this tale of revenge.

"The Wrath Of Magra" comes as three, 48K programs on cassette, boxed with instruction manual and book detailing the history of the Third Continent and the many spells you will be using throughout the game.

NOTE: "The Wrath Of Magra" is a complete adventure. You need not buy "Volcanic Dungeon" or "Black Crystal" to play it.

Available through most good computer stores or direct from:
Carnell Software Ltd, North Weylands Industrial Estate, Molesey Road, Hersham, Surrey KT12 3PL.
Dealers: Contact us for your nearest wholesaler.

CARNELL SOFTWARE LTD

fantasy SOFTWARE

THE PYRAMID is an arcade style game which has a very adventurous feel to it.

The Pyramid contains 120 chambers on 15 levels. In order to get from one chamber to another you must fight off the indigenous aliens to collect an energised crystal which will neutralize the force field guarding the two exits.

The Pyramid is inhabited by a total of 60 wierd and exotic alien types, all of which are beautifully animated. You will meet a whole variety of demons, droids, insects and monsters, with a sprinkling of the more unusual, the extra-terrestrial tweezers, galactic strawberry, cosmic claw, mutant eye, plus a whole host of entities that defy rational description. You will no doubt invent your own nicknames.

You proceed to explore the Pyramid from top to bottom with the difficulty generally increasing with the depth of level. Depending on the choice of exit from each chamber you are likely to have a different game every time you play.

Apart from the challenge of trying to achieve the highest score possible the pyramid contains a number puzzle to solve. The more chambers you successfully visit the more information is gathered to enable you to discover the secret numbers of the pyramid. The puzzle won't take you a few days to solve, it will probably take you a few months.



This is "ZIGGY". He is shown above in his exploratory capsule and is a true representation of the on screen graphics. You have total control over his movements as you explore the many chambers of "THE PYRAMID".

FANTASY SOFTWARE is available from W.H.Smiths, John Menzies and Computers For All

Compatible with all leading joysticks.

THE PYRAMID

For 48K Spectrum

THE PYRAMID is available at £5.50 from
FANTASY SOFTWARE, FAUCONBERG LODGE, 27A ST. GEORGES ROAD, CHELTENHAM, GLOS GL50 3DT
despatched by return first class post together with a membership number entitling you to discount on our forthcoming blockbusting software.
Trade Enquiries welcome – telephone 0242-583661

RUNS ON SPECTRUM

GRID RACE



Grid Race is a fast, all action game, in which you have to prevent "The Runner" from reaching the bottom of a grid.

As well as this task, you have also to get rid of other creatures which work their way down the grid at regular intervals.

On running the program, after the instructions, (which can be removed by deleting line 70 and lines 6000-6160) you are faced with an eight by eight grid with your base at the bottom. Use the keys as follows: S-Left, 8-Right, 0-Fire.

Variables Used

A$ = Graphic character, when defining graphics.
B$ = Title of screen.
C$ = Extra character on screen.
G$, H$ = Grid
M$ = Display of bases left.
B = Byte of UDG.

BASE = Column position of base on row 19.
C = Extra character on screen toggle.
EXX = Newposition of extra character.
EXY = Column position of extra character.
RUNNERX = Row position of runner.
RUNNER Y = Column position of runner.

O = Old position of runner.
MRND = Holds random number.
CREUT = When CREUT = then runner has reached bottom. When CREUT = 1 then the extra character has reached the bottom.
FIN = Determines which random number to use.
SCORE = Holds current score.
HISCORE = Holds current hi score.

MEN = Number of bases left.
X, L = Used for various control loops.

Rundown

86 Reset scores to 0.
95 Test if extra character is on screen.
100 Store old column of runner.

```
  5 REM **********************
 10 REM **** GRUDRUNNER ****
 15 REM **********************
 20 REM * © david barmood **
 25 REM **********************
 30 REM ** DATE Jan 1984 ***
 35 REM **********************
 55 REM set up graphics
 60 GO SUB 5000
 65 REM instructions
 70 GO SUB 6000
 75 REM set up screen
 80 GO SUB 7000
 85 REM main program
 86 LET score=0: LET hiscore=0
 87 LET men=4
 88 REM to get [ship] type in 'm'
 in graphics mode
 89 LET m$="[ship][ship][ship]"
 90 REM
 95 IF c=1 THEN GO SUB 335
100 LET o=runnerx
105 LET mrnd=RND
110 IF RND>.5 THEN LET runnerx=
runnerx+(2*(mrnd>0.5) *(runnerx<
19)): GO TO 125
115 IF RND<.7 THEN LET runnery=
runnery+(1*(mrnd>0.5)*(runnery<1
5))-(1*(mrnd<0.5)*(runnery>4))
120 REM to get [ball] , type in 'j
' in graphics mode
125 PRINT AT o,0;g$;AT o+1,0;h$
;"
130 PRINT AT runnerx,runnery;"[
135 IF runnerx>=18 THEN LET cre
at=0: GO SUB 4115
140 PRINT AT 19,base;"  [ship]  "
145 IF RND<.05 AND c<>1 THEN GO
SUB 300
150 LET base=base+(INKEY$="8")*
(base<15)-(INKEY$="5")*(base<>0)
155 IF INKEY$<>"0" THEN GO TO 0
85
160 PLOT (base+2)*8+3,22: DRAW
OVER 1;0,137: BEEP .006,20: PLOT
(base+2)*8+3,22: DRAW OVER 1;0,
137
165 IF base+1=runnery OR base+2
=runnery OR (base+2=INT (exy) AN
D c=1) THEN GO SUB 4000: GO SUB
7000
170 GO TO 085
300 REM other creatures
305 RESTORE 330: LET fin=RND*4+
1
310 FOR x=1 TO fin
315 READ c$
320 NEXT x
325 REM to get [ball] , type in 'e'
in graphics mode to get [bug] , typ
e in 'f' in graphics mode to ge
t [bug] ,type in 'g' in graphics mod
e to get [bug] , type in 'h' in gra
phics mode
330 DATA "[ball]","[bug]","[bug]","[bug]"
335 LET o1=exx
340 IF RND>.4 THEN LET exx=exx+
(2*(RND>.5))*(exx<19)
345 LET r=RND: IF RND<.7 THEN L
ET exy=exy+(3*(r>.5)*(exy<15)-(3
*r<.5)*(exy>6))
350 IF exx>=18 THEN LET creat=1
 GO SUB 4115
355 PRINT AT o1,0,g$,AT o1+1,0;
```

```
h$; INK x; PAPER 9; FLASH 1;AT e
xx,exy;c$
360 LET c=1: RETURN
4000 REM explode & update scores
4005 PRINT AT 12,18;"HIT HIT HIT
"
4010 IF base+2=INT (exy) THEN LE
T score=score+100*x: GO TO 4075
4015 FOR x=0 TO 3
4020 BORDER RND*7
4025 BEEP .01,-20
4030 PRINT INK 0; PAPER 7;AT run
nerx,runnery;"[bug]"
4035 BEEP .01,-10
4040 PRINT INK 7; PAPER 0;AT run
nerx,runnery;"[bug]";AT runnerx,run
nery;"[ship]"
4045 BEEP .01,-5
4050 PRINT INK 0; PAPER 7;AT run
nerx,runnery;"[ship]"
4055 REM PRINT AT 0,0; OVER 1; I
NK 9; PAPER x;a$
4060 NEXT x
4065 LET score=score+100
4070 GO TO 4110
4075 FOR x=0 TO 7
4080 BEEP .01,x
4085 PRINT AT exx,exy; INK 0; PA
PER 7;"[bug]"
4090 BEEP .01,x
4095 PRINT AT exx,exy; INK 7;"[bug]"
4100 NEXT x
4105 LET score=score+100
4110 RETURN
4115 REM ship destroy
4120 IF creat=1 THEN PRINT AT o1
,0;g$;AT o1+2,exy;c$: GO TO 4135
4125 PRINT AT runnerx,runnery;"
"
4130 REM to get [ship] , type in 'o'
in graphics mode
4135 PRINT AT 19,base;" [ship]  "
4140 RESTORE 4145
4145 DATA 1,0,1,0,.5,2,.5,0,.5,0
,.5,0,.5,-1,.5,0,.5,1,1,0
4150 FOR a=1 TO 10
4155 READ b,c
4160 BEEP b,c
4165 NEXT a
4170 LET m$=m$(5 TO )
4175 PRINT AT 21,20;m$
4180 LET men=men-1
4185 IF men=0 THEN CLS : PRINT A
T 10,10;"no bases left": PAUSE 2
00: PRINT AT 12,0;"Press Any Key
 To Play Again": PAUSE 1e4: LET
men=4: LET m$="[ship][ship][ship]": LET
 score=0: GO TO 75
4190 PRINT AT 18,0;  : FOR z=1
TO 10
4195 GO SUB 6115: GO SUB 7000: G
O TO 085
5000 REM set up graphics
5005 RESTORE 5050
5010 FOR x=1 TO 15
5015 READ a$
5020 FOR i=0 TO 7
5025 READ b
5030 POKE USR a$+i,b
5035 NEXT i
5040 NEXT x
5045 RETURN
5050 DATA "a",BIN 10000000,BIN 1
```

110 Move runner on grid by column.
115 Move runner on grid by row.
125 Replace grid where runner was.
130 Print new position of runner.
135 Test if runner had reached the bottom.
140 Print base.
145 Test if to start new character on screen.
150 Move base.

155 See if fire button is pressed.
160 Fire.
165 Test if a hit.
300 330 = Choose extra characters.
335 Store row of extra characters.
340 Move extra characters by row.
345 Move extra characters by column.
350 Test if extra character has reached the bottom.

360 GOTO main program.
4000 Explode the runner or the creature and update scores accordingly.
4115-4195 Destroy the ship.
5000-5120 Define the graphics.
6000-6160 Instructions.
7000-7055 Set up screen.
7050-7085 Set up variables.
9000-9030 Display title.

```
0000000,BIN 10000000,BIN 1111111
1,BIN 11111111,BIN 10000000,BIN
10000000,BIN 10000000
5055 DATA "b",BIN 00000001,BIN 0
0000001,BIN 00000001,BIN 1111111
1,BIN 11111111,BIN 00000001,BIN
00000001,BIN 00000001
5060 DATA "c",BIN 10000000,BIN 1
0000000,BIN 10000000,BIN 1000000
0,BIN 10000000,BIN 10000000,BIN
10000000,BIN 10000000
5065 DATA "d",BIN 00000001,BIN 0
0000001,BIN 00000001,BIN 0000000
1,BIN 00000001,BIN 00000001,BIN
00000001,BIN 00000001
5070 DATA "e",BIN 01110001,BIN 0
1001001,BIN 01001001,BIN 0100100
1,BIN 01001001,BIN 01001001,BIN
11001001,BIN 11001110
5075 DATA "f",BIN 11111111,BIN 1
1000011,BIN 10100101,BIN 1010010
1,BIN 10000001,BIN 10011001,BIN
10000001,BIN 01111110
5080 DATA "g",BIN 00000000,BIN 0
1100110,BIN 00000000,BIN 0001100
0,BIN 00000000,BIN 10000001,BIN
01111110,BIN 00000000
5085 DATA "h",BIN 00011000,BIN 0
1111110,BIN 10100101,BIN 1001100
1,BIN 10011001,BIN 00100100,BIN
01000010,BIN 00100100
5090 DATA "i",BIN 00010110,BIN 0
0101001,BIN 01001001,BIN 1010100
1,BIN 10101001,BIN 01001001,BIN
00101001,BIN 00010110
5095 DATA "j",BIN 11010000,BIN 0
0101100,BIN 00101011,BIN 0010101
1,BIN 00101011,BIN 00101100,BIN
00101000,BIN 11010000
5100 DATA "k",BIN 00100000,BIN 0
0000010,BIN 01000000,BIN 0001000
0,BIN 00000001,BIN 01000010,BIN
00010000,BIN 10010000
5105 DATA "l",BIN 00000000,BIN 0
0000000,BIN 00000000,BIN 0000000
0,BIN 00000011,BIN 00000011,BIN
11111111,BIN 11111111
5110 DATA "m",BIN 00000000,BIN 0
0010000,BIN 00010000,BIN 0011100
0,BIN 11111111,BIN 11111111,BIN
11111111,BIN 11111111
5115 DATA "n",BIN 00000000,BIN 0
0000000,BIN 00000000,BIN 0000000
0,BIN 10000000,BIN 10000000,BIN
11111111,BIN 11111111
5120 DATA "o",BIN 00011000,BIN 0
0011000,BIN 01111110,BIN 0111111
0,BIN 01111110,BIN 00011000,BIN
00011000,BIN 00011000
6000 REM instructions
6005 INK 4: PAPER 0: BORDER 0: C
LS
6010 LET b$="GRIDRUNNER": LET b=
LEN b$: LET o=5
6015 GO SUB 9000
6020 PRINT '''"You Are At The Bot
tom Of An 8X8"
6025 PRINT "Grid With Your Base
And You Have"
6030 PRINT "To Protect The Rest
Of The World"
6035 PRINT "By Killing All The C
reatures"
6040 PRINT "That Approach You"
```

```
6045 PRINT '' INK 1; PAPER 7; FL
ASH 1;"** PRESS ANY KEY TO CONTI
NUE **"
6050 IF INKEY$="" THEN GO TO 605
0
6055 DIM a$(704): FOR i=1 TO 7
6060 BEEP .01,i*3
6065 PRINT AT 0,0; OVER 1; PAPER
i; INK 9;a$
6070 NEXT i
6075 PRINT AT 0,0; OVER 1; INK 4
; PAPER 0;a$
6080 INK 7: PAPER 1: BORDER 1: C
LS
6085 LET b$="KEY & POINTS": LET
b=LEN b$: LET o=2: GO SUB 9000
6090 PRINT '''"5----left      8--
--right"
6095 PRINT ''"          0----fire"
6100 PRINT ''"          ▓----100
points"
6105 PRINT '"▒----100 points  ▒-
---200 points"
6110 PRINT '"▒----300 points  ▒-
---400 points"
6115 PRINT '' INK 2; PAPER 7; FL
ASH 1;"** PRESS ANY KEY TO CONTI
NUE **"
6120 PAUSE 1e4
6125 DIM a$(704): FOR i=1 TO 7
6130 BEEP .007,-i*3
6135 PRINT AT 0,0; OVER 1; INK i
; PAPER 9;a$
6140 NEXT i
6145 CLS
6150 PRINT AT 10,10; FLASH 1;"GE
T READY"
6155 FOR i=1 TO 200: NEXT i
6160 RETURN
7000 REM set up screen
7005 INK 6: PAPER 0: BORDER 0: C
LS
7010 REM to get ├┤ , type in 'ab
' in graphcs mode    to get | | ,
type in 'cd' in graphcs mode
7015 LET g$="                "
7020 LET h$="                "
7025 PRINT AT 2,0;
7030 FOR x=1 TO 8
7035 PRINT g$: PRINT h$
7040 NEXT x
7045 IF hiscore<score THEN LET h
iscore=score
7050 PRINT AT 4,20; INK 7;"SCORE
--";score: PRINT AT 6,20; INK 7;
"HI SCORE--";hiscore
7055 PRINT AT 21,20;m$
7060 REM set up variables
7065 LET base=1
7070 LET c=0
7075 LET runnerx=2: LET runnery=
INT (RND*14+2)
7080 LET exx=2: LET exy=3
7085 RETURN
9000 FOR i=1 TO b
9005 PRINT AT 0,(i*2)+o;b$(i)
9010 PRINT OVER 1;AT 0,(i*2)+o;"
"
9020 BEEP i/10,b*2
9025 NEXT i
9030 RETURN
```

No 2
Feb/March 198

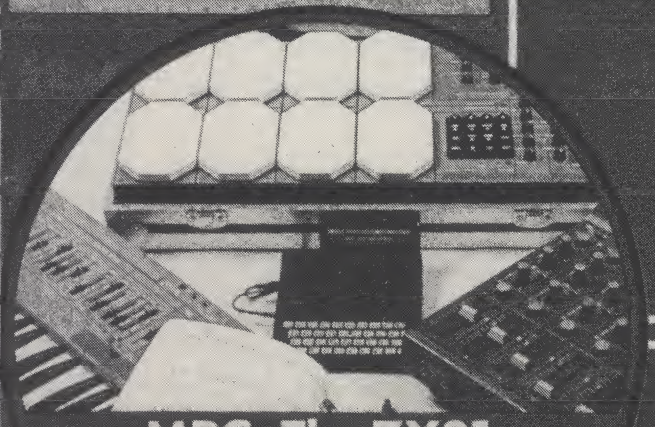
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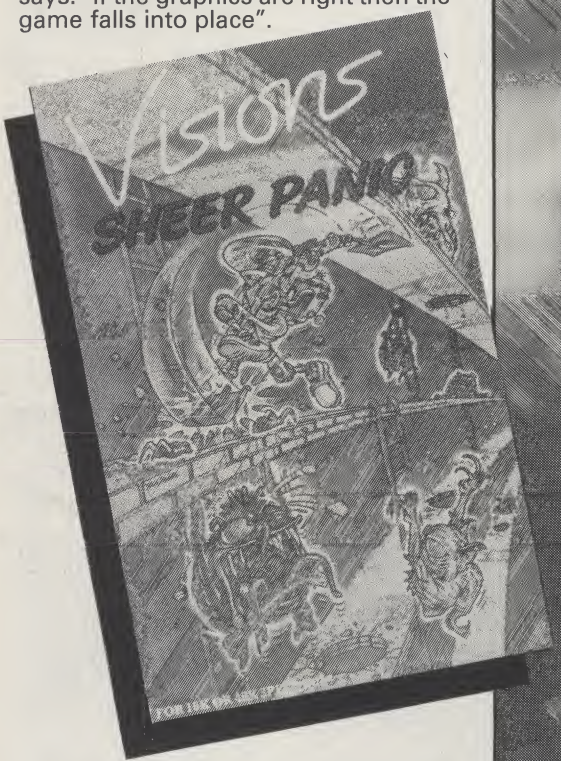
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It took just a flight of stairs for 20 year old Kevin Bezant to dream up a computer game — and about three months to convert it into a program. (The result is Visions' Software Factory's latest best selling Spectrum game, 1994 (Ten Years After). Kevin, in an interview with *Games Computing*, said he gets his ideas at the most unlikely times, but the ideas are the most difficult part of producing a program. From then on the programming just takes time.

Kevin likes to start with an original theme or idea, never copying something else, and go on from there. When writing his latest game, which is not yet released, Kevin wanted to use a helicopter because they're not used very much in current video games. Then he had to decide between a Defender style horizontal zap game, or a novelty game. Eventually he opted for a novelty game, making the helicopter clockwork and shooting at toy tanks and other objects.

"The important thing to find is what will work well with the graphics" he says. "If the graphics are right then the game falls into place".



Kevin specailizes in machine code arcade style games for the Spectrum's Z80A processor. His games are not written using a specialized development system with vast mainframes like some computer programmers, for instance Psion use a huge PDP VAX11 mini computer to work out their games. Kevin has a standard ZX Spectrum without even a 'real' keyboard to take the strain. He does however use the Picturesque assembler and is intending to get the Zeus assembler.

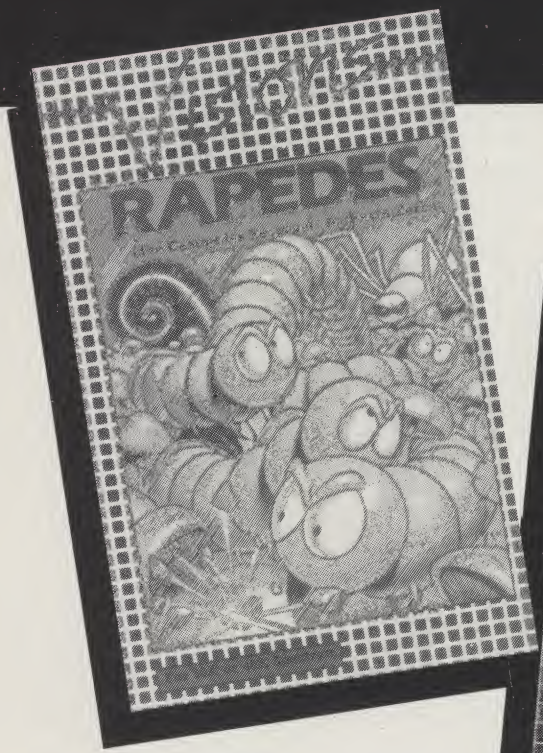
"Assemblers are essential for games writing as any game must seriously be written in machine code to be any good at all, basic games are just too slow."

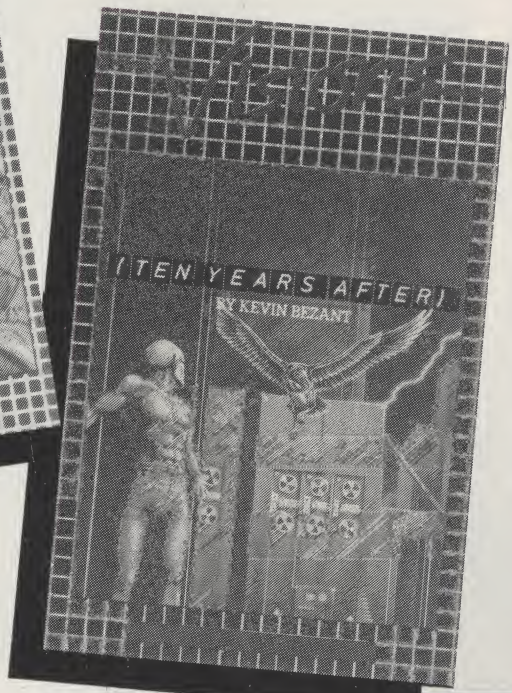
Although Kevin writes original games and not straight copies of arcade games, he likes to look through the pages of other software houses' catalogues to see what games are on the market, which helps him with the ideas side of games writing.

In his 15 month career as a commer-



Inner Visions





cial games writer Kevin has written four games, one ZX81 game for Quicksilva, Lunar Rescue, and three ZX Spectrum games for Visions, Sheer Panic, Rapeedes, and 1994 (Ten Years After).

Kevin started his association with Visions when its managing director, Sean de Bray saw some of Kevin's work and subsequently offered him a contract. All of Kevin's Spectrum work has so far been published by Visions.

His all time favourite game is probably Williams' Defender as that was the game he probably put the most money into! As far as computer games go Kevin likes all Acornsoft games due to their highly accurate reproduction of original arcade games. This is helped mainly by the BBC Micro which he considers to be a good games machine. Kevin does not particularly like the Spectrum as a games machine due to its relatively poor graphics and lack of sound. As a computer to write for Kevin has his problems. "The Spectrum cassette interface is very unreliable and sometimes I have to save a program four or five times, and for 40K of code that's up to half an hour watching a cassette recorder".

Kevin also has his criticisms of the Spectrum's sound and graphics abilities, or lack of them. "The display file on the Spectrum is very awkward and the sound is virtually non-existant, the keyboard is very hard to use".

Kevin's dislikes for some computer games are usually to do wwith bad keyboard control. "For Ultimate's Lunar Jetman you need to be an audio typist with twelve fingers to play it, it has so many controls. I like a game with simple controls. In 1994 I gave the user only five keys to contend with.

Kevin works 40 hours a week as an electronics apprentice for Thorn EMI at Feltham. He finishes his apprenticeship in eight months time but does not want to go into writing software full time as he has some doubts about the security of having the sort of job which relies on public demand. Today the climate is fine but who knows when the computer boon will end.

"I have very little social life at all, although I do take Saturday and Sunday evenings off". It's not surprising when he spends 40 of his spare hours a week writing software. But if his games are best sellers it pays dividends with 25% royalties per game from Visions.

Kevin likes delving into the Sinclair ROM and says "there are things in the Sinclair ROM that are not used like a 42 column screen handler".

As to the future of the computer market Kevin thinks that there is definitely a future in the games industry "there will always be a demand for games, new games mainly, but the bottom isn't going to drop out of the market just yet".



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BREA

RUNS ON BBC/B

This is a version of the popular arcade game. At the start of this program you find yourself facing a multicoloured wall of bricks which you have to knock out using the bat and ball. The wall moves steadily towards you and is replenished from time to time.

Options

The controls are simply Z for left and X for right. If the ball hits the left hand side of your bat it will bounce off to the left and so on. Before the game begins, you can choose ball speed (one to five, five being the fastest). Now you are ready to go. The game runs on a model A or B without any alterations. There is also a top ten scoreboard to record your prolific scoring feats.

Program Description

Lines 10-160 are employed making the introductions and setting up the top ten board.

PROCsetup. This draws the wall and court ready for play. It also sets up the sound.

PROCbatmove. Line 450 sets up most of the variables. Lines 460-510 move the bat and lines 520-540 decide the time for the computer to wait before moving the wall down.

PROCballmove. This moves the ball, checking to make sure it does not go off the edge of the screen. It also wipes out a brick if hit.

PROClifelost. Gets rid of one of your lives and checks to see if you have any left.

PROCend. Asks if you want another game.

PROCscrolldown. Decides if there is another layer of bricks needed or not, after the wall has moved.

PROCintro. Self-explanatory. It also sets up the ball speed.

PROChiscores. Puts your name up in lights.

PROCmaccode. This is a short machine code routine which moves the wall down quickly enough to allow uninterrupted play.



AKOUT

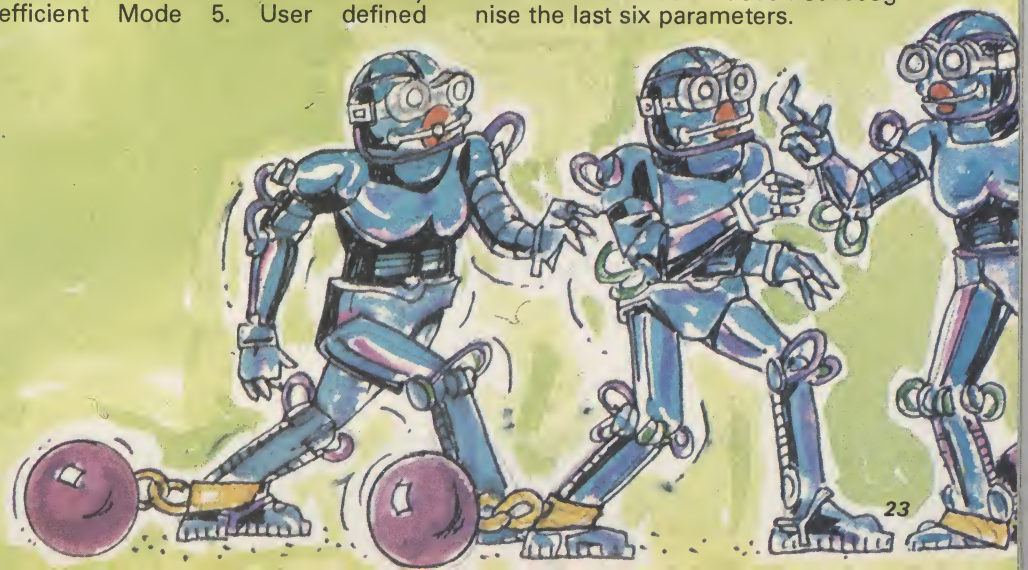
Main Variables

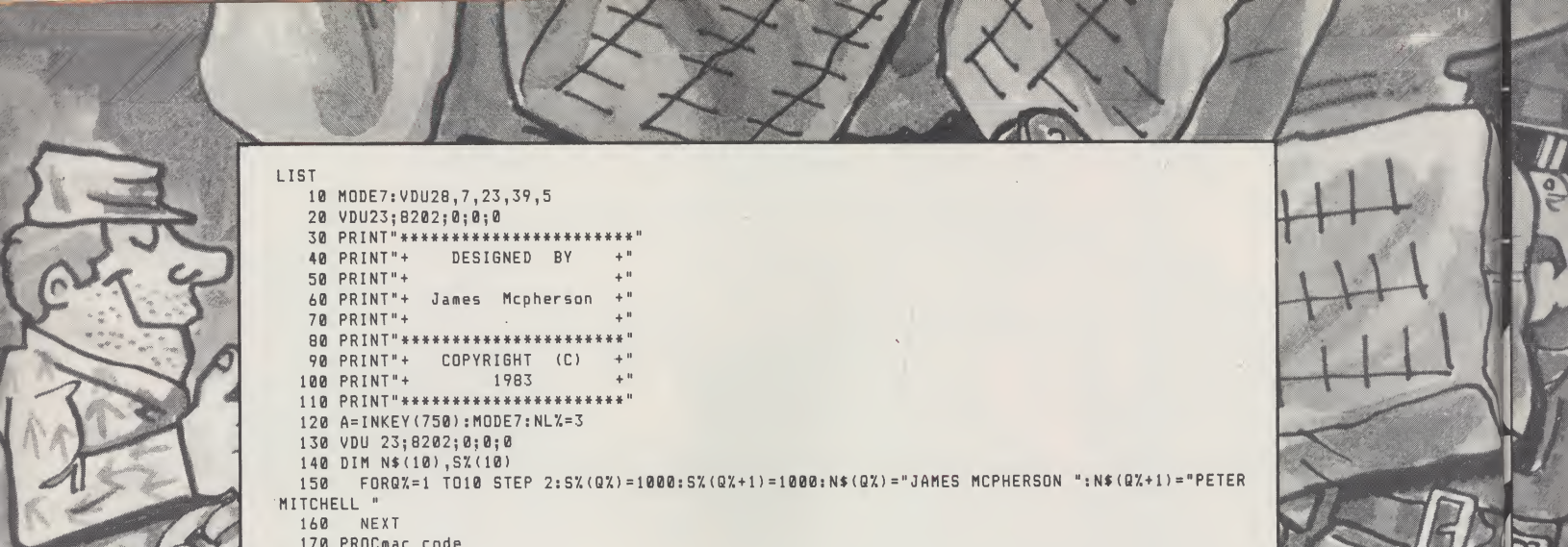
SCORE% is the score.
L% is the number of lives.
X% and Y% are the coordinates of the bat.
BX% and BY% are coordinates of the ball.
M and BX1 and BY1 are the ball directions.
S is the ball speed.

Conversion Clues

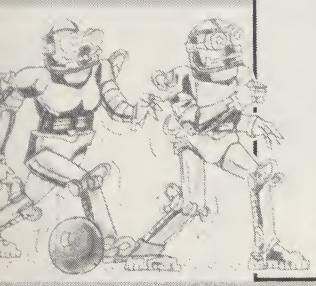
Mode 7 Teletext is unique to the BBC Micro among home computers so some changes will have to be made before the program will RUN on other machines. It should be fairly easy to convert however to RUN on the BBC's sister machine, the Electron. Both use BBC BASIC but the Electron lacks Mode 7.

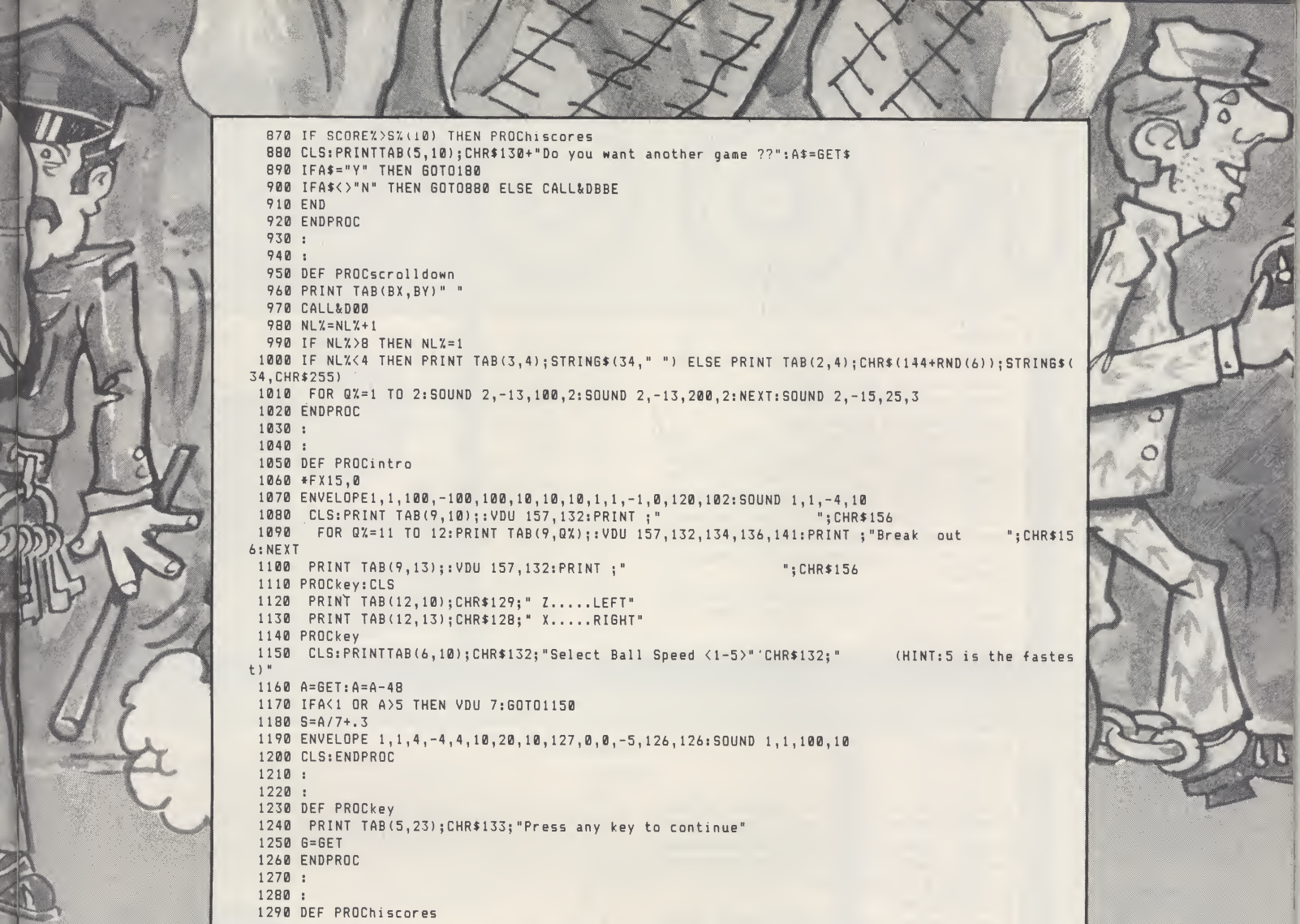
The logical choice of mode for the Electron is the four colour but memory efficient Mode 5. User defined characters can be created to replace the teletext block graphics and Mode 7 CHR$ codes will have to be dispensed with. VDU 19 can provide some colour variation and the ENVELOPE statements can be modified to allow for the fact that the Electron does not recognise the last six parameters.





```
LIST
   10 MODE7:VDU28,7,23,39,5
   20 VDU23;8202;0;0;0
   30 PRINT"**********************"
   40 PRINT"+    DESIGNED  BY    +"
   50 PRINT"+                    +"
   60 PRINT"+  James  Mcpherson  +"
   70 PRINT"+                    +"
   80 PRINT"**********************"
   90 PRINT"+   COPYRIGHT  (C)   +"
  100 PRINT"+        1983        +"
  110 PRINT"**********************"
  120 A=INKEY(750):MODE7:NL%=3
  130 VDU 23;8202;0;0;0
  140 DIM N$(10),S%(10)
  150   FORQ%=1 TO10 STEP 2:S%(Q%)=1000:S%(Q%+1)=1000:N$(Q%)="JAMES MCPHERSON ":N$(Q%+1)="PETER
MITCHELL "
  160   NEXT
  170 PROCmac_code
  180 PROCintro
  190 PROCsetup
  200 PROCbatmove:END
  210 END
  220 :
  230 :
  240 DEF PROCsetup
  250 PLACE=1
  260 VDU 23;8202;0;0;0;
  270   L%=4:FOR Q%=7 TO 11
  280   PRINT TAB(2,Q%);CHR$(144+RND(6));STRING$(34,CHR$255)
  290   NEXT
  300 FOR Q%=2 TO 23:PRINT TAB(0,Q%);CHR$146;"5":PRINT TAB(37,Q%);CHR$146;"j"
  310   NEXT
  320 PRINT TAB(1,2);"7``````````````````````````````````k"
  330 SCORE%=0
  340 PRINT TAB(1,0);CHR$129;"SCORE=0";TAB(11);CHR$133;"Hi-score ";S%(1);TAB(27);CHR$129;"LIVES=
3"
  350 FOR Q%=1TO4
  360   SOUND1,-14,10,3:SOUND1,-15,200,2
  370   SOUND1,-9,255,1
  380   NEXT
  390 SOUND1,-15,0,5
  400 A=INKEY(100)
  410 ENVELOPE3,5,10,-10,10,200,200,200,120,120,0,0,30,30:SOUND3,3,255,1
  420 ENDPROC
  430 :
  440 :
  450 DEF PROCbatmove
  460 X%=17:Y%=22:BX%=19:BY%=21:BX=19:BY=21:M=1:BX1=(RND(3)-2)*M:BY1=1:TIME=0
  470 PRINT TAB(X%-1,Y%);"      "
  480 X%=X%+INKEY(-98)*2+(-2*INKEY(-67))
  490 IF X%>32 THEN X%=32
  500 IF X%<3 THEN X%=3
  510 PRINT TAB(X%,Y%);"``````"
  520 PROCballmove
  530 IF TIME<2500*(1.3-S) THEN GOTO 470
  540 PROCscrolldown:TIME=0
  550 GOTO 470
  560 ENDPROC
  570 :
  580 :
  590 DEF PROCballmove
  600 IF BX%>36 THEN BX1=M*-1
  610 IF BX%<4 THEN BX1=M
  620 IF BY%=3 THEN BY1=BY1*-1
  630 IF BY%=Y%-1 AND BX%<X%+6 AND BX%>X%-1 THEN BY1=BY1*-1:SOUND 1,-13,75,1:SOUND 1,-13,0,1
  640 IF BY%=Y%-1 AND (BX%=X% OR BX%=X%+1) THEN BX1=-1*M
  650 IF BY%=Y%-1 AND BX%=X%+2 THEN BX1=0
  660 IF BY%=Y%-1 AND (BX%=X%+3 OR BX%=X%+4) THEN BX1=M
  670 PRINT TAB(BX%,BY%)" "
  680 BX=BX+(BX1*S):BY=BY+(BY1*S)
  690 BX%=BX:BY%=BY
  700 IF ?(HIMEM+INT(BX)+INT(BY)*40)=255 THEN BY1=BY1*-1:SCORE%=SCORE%+10:PRINT TAB(8,0);SCORE%:
 BX1=(RND(3)-2)*M:SOUND 1,-13,150,1:SOUND 1,-13,255,1
  710  IF BY%>Y%-1 THEN PROClifelost
  720 PRINT TAB(BX%,BY%)"0"
  730 ENDPROC
  740 :
  750 :
  760 DEF PROClifelost
  770 L%=L%-1:IF L%=0 THEN PROCend
  780 PRINT TAB(X%,Y%);"       "
  790 SOUND 0,-9,6,9
  800 PRINT TAB(35,0);L%-1
  810 PROCbatmove
  820 ENDPROC
  830 :
  840 :
  850 DEF PROCend
  860 *FX15,0
```





```
  870 IF SCORE%>S%(10) THEN PROChiscores
  880 CLS:PRINTTAB(5,10);CHR$130+"Do you want another game ??":A$=GET$
  890 IFA$="Y" THEN GOTO180
  900 IFA$<>"N" THEN GOTO880 ELSE CALL&DBBE
  910 END
  920 ENDPROC
  930 :
  940 :
  950 DEF PROCscrolldown
  960 PRINT TAB(BX,BY)" "
  970 CALL&D00
  980 NL%=NL%+1
  990 IF NL%>8 THEN NL%=1
 1000 IF NL%<4 THEN PRINT TAB(3,4);STRING$(34," ") ELSE PRINT TAB(2,4);CHR$(144+RND(6));STRING$(
34,CHR$255)
 1010  FOR Q%=1 TO 2:SOUND 2,-13,100,2:SOUND 2,-13,200,2:NEXT:SOUND 2,-15,25,3
 1020 ENDPROC
 1030 :
 1040 :
 1050 DEF PROCintro
 1060 *FX15,0
 1070 ENVELOPE1,1,100,-100,100,10,10,10,1,1,-1,0,120,102:SOUND 1,1,-4,10
 1080  CLS:PRINT TAB(9,10);:VDU 157,132:PRINT ;"                    ";CHR$156
 1090   FOR Q%=11 TO 12:PRINT TAB(9,Q%);:VDU 157,132,134,136,141:PRINT ;"Break  out      ";CHR$15
6:NEXT
 1100  PRINT TAB(9,13);:VDU 157,132:PRINT ;"                    ";CHR$156
 1110 PROCkey:CLS
 1120  PRINT TAB(12,10);CHR$129;" Z.....LEFT"
 1130  PRINT TAB(12,13);CHR$128;" X.....RIGHT"
 1140 PROCkey
 1150  CLS:PRINTTAB(6,10);CHR$132;"Select Ball Speed <1-5>"'CHR$132;"      (HINT:5 is the fastes
t)"
 1160 A=GET:A=A-48
 1170 IFA<1 OR A>5 THEN VDU 7:GOTO1150
 1180 S=A/7+.3
 1190 ENVELOPE 1,1,4,-4,4,10,20,10,127,0,0,-5,126,126:SOUND 1,1,100,10
 1200 CLS:ENDPROC
 1210 :
 1220 :
 1230 DEF PROCkey
 1240  PRINT TAB(5,23);CHR$133;"Press any key to continue"
 1250 G=GET
 1260 ENDPROC
 1270 :
 1280 :
 1290 DEF PROChiscores
 1300 *FX15,0
 1310 ENVELOPE1,1,10,-10,4,100,200,100,127,0,0,-5,0,20
 1320 SOUND1,1,-10,-1
 1330 FORQ%=1 TO 10
 1340    IFS%(Q%)>SCORE% THEN PLACE=PLACE+1
 1350   NEXT
 1360 A=INKEY(500):CLS
 1370 PRINTTAB(5,10);CHR$157;CHR$132;CHR$129;"Congratulations  ";CHR$156;'';TAB(6);CHR$134;"You
are ranked ";PLACE;" out of TEN."
 1380 PRINT'';CHR$134;"Please enter your name below."
 1390 INPUT N$
 1400 FOR Q%=10 TO PLACE STEP -1
 1410   N$(Q%)=N$(Q%-1):S%(Q%)=S%(Q%-1)
 1420   NEXT
 1430 PROCkey:CLS
 1440 PRINTTAB(11,0);CHR$136;CHR$130;"HI-SCORES"
 1450 N$(PLACE)=N$:S%(PLACE)=SCORE%
 1460 FORQ%=1 TO 10
 1470     PRINTTAB(3,Q%*2);CHR$(127+RND(6));S%(Q%);".....";N$(Q%)
 1480   NEXT
 1490 PROCkey:CLS
 1500 PRINT TAB(3,10);CHR$130;"Do you want another game ??":A$=GET$
 1510 IF A$="N" THEN CALL&DBBE
 1520 IF A$<>"Y"THEN VDU7:GOTO1500
 1530 GOTO180
 1540 ENDPROC
 1550 :
 1560 :
 1570 REM ** Type the machine code **
 1580 REM ** in carefully or else  **
 1590 REM **  it may destroy the   **
 1600 REM **    whole program.     **
 1610 :
 1620 :
 1630 DEF PROCmac_code
 1640 P%=&D00:FOR I%=0 TO 2 STEP 2
 1650   [OPT I%:LDA #&7F:STA &71:LDA #&48:STA &70
 1660   LDX #22:.LOOP1:LDA &70:STA &72:LDA &71:STA &73:LDA &70:SEC:SBC #40:STA &70:LDA &71:SBC#0
:STA &71
 1670   DEX:LDY #1:.LOOP
 1680   INY:LDA (&70),Y:STA (&72),Y:CPY #37:BNE LOOP
 1690   CPX #5:BNE LOOP1
 1700   RTS:]:NEXT
 1710 ENDPROC
```

TRS80

Snake:

When you run this programme the screen shows this display:
Press space bar to play
(you press the space bar)
The screen displays a snake like creature at the top of the screen. Blocks move rapidly up the screen and you have to dodge them. You have the keys ‹ and › (these are the more than and less than keys next to the space bar). Your score is decided by the time you survive.
If you want to change the keys you will have to change lines 125, 130, and 135.
Happy dodging.

```
0 REM *** SNAKE GAME 04/11/83 ***
100 CLS:GOTO 160
105 CLS:Z=20:S=0:C$=STRING$(5,CHR$(191))
110 PRINT@320+Z,CHR$(175);CHR$(159);
115 PRINT@960+(RND(56)-1),C$
120 REM
125 A$=INKEY$:IF A$="," OR A$="." THEN B$=A$
130 IF B$="," AND Z<>00 THEN Z=Z-1
135 IF B$="." AND Z<>61 THEN Z=Z+1
140 IF POINT(Z*2,15)=-1 THEN GOTO 150
145 S=S+1:GOTO 110
150 FORD=1 TO 200:NEXT:CLS
155 PRINT"SCORE :";S
160 PRINT"PRESS SPACE TO PLAY"
165 IF INKEY$=" " THEN GOTO 105 ELSE 165
```

Dodgems:

This game is for two players which have to out dodge each other. Each player controls a snake which they have to use to block the opponent with causing them to crash.
The rules are:
Each player must avoid going back onto their track.
Each player must avoid going into the border.
Each player must avoid hitting the opponents track.
Each player must block off the other.

The keys are:

Player 1

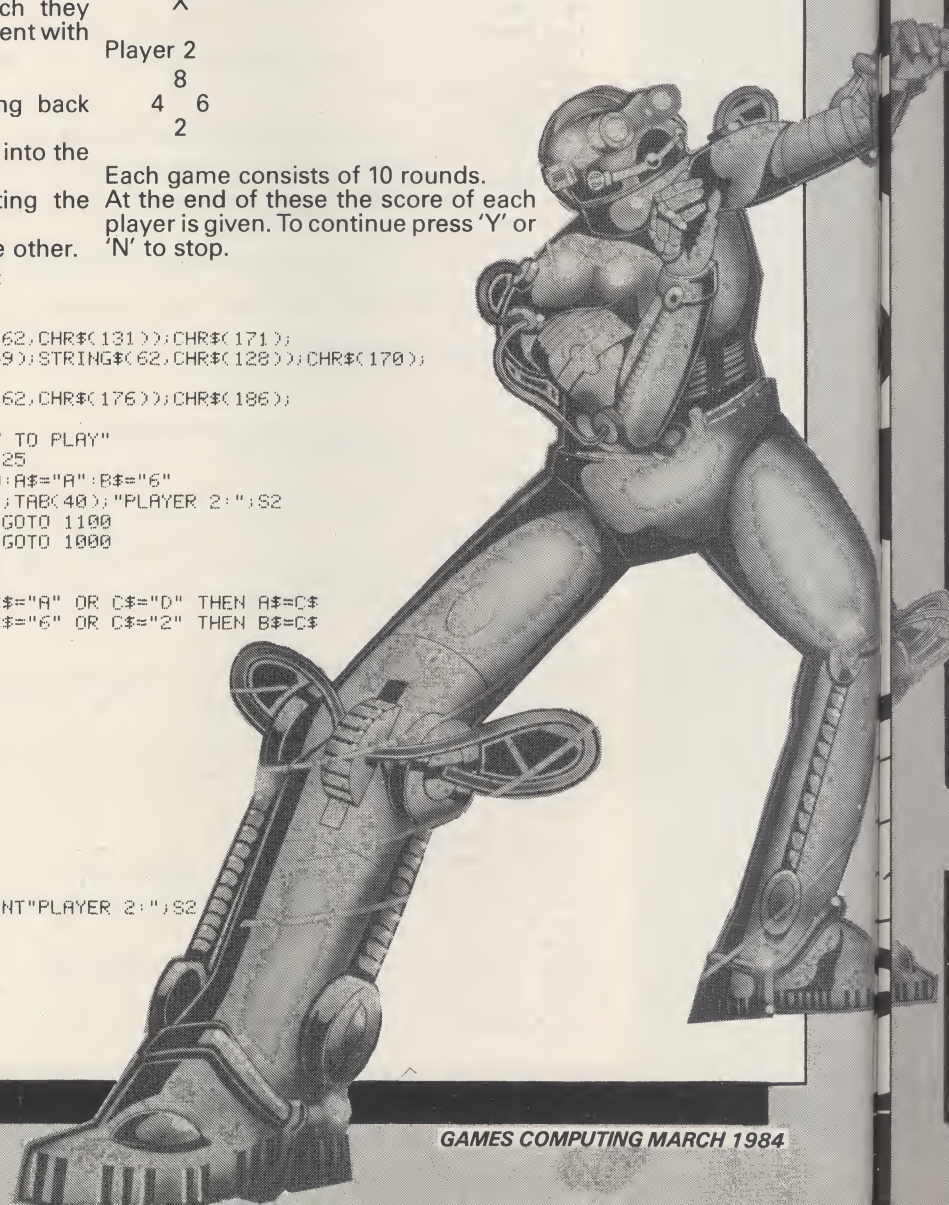
```
  W
A   D
  X
```

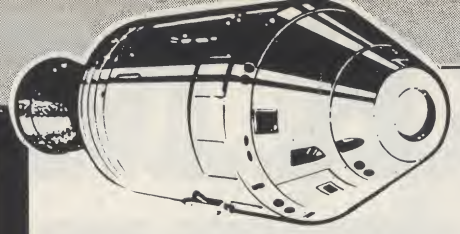
Player 2

```
  8
4   6
  2
```

Each game consists of 10 rounds.
At the end of these the score of each player is given. To continue press 'Y' or 'N' to stop.

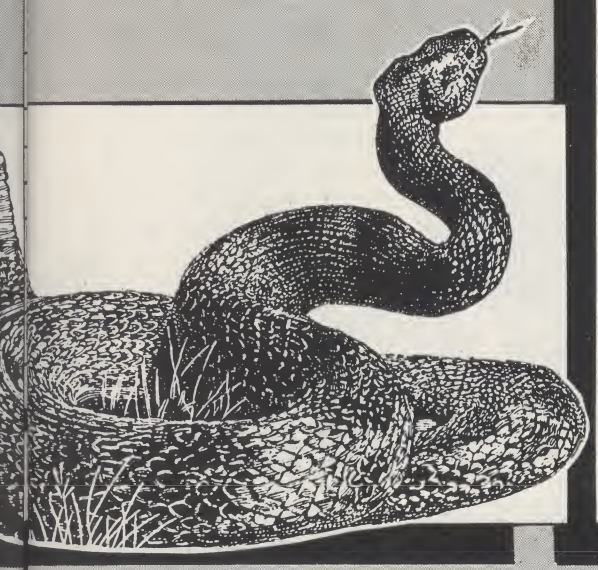
```
0 REM ** DODGEMS 06/11/82 **
10 CLEAR 1000:S1=0:S2=0
100 FORT=1 TO 10
105 PRINT CHR$(151);STRING$(62,CHR$(131));CHR$(171);
110 FORA=1TO10:PRINT CHR$(149);STRING$(62,CHR$(128));CHR$(170);
115 NEXT A
116 PRINT CHR$(181);STRING$(62,CHR$(176));CHR$(186);
117 PRINT:PRINT:PRINT
121 PRINT@832,"PRESS ANY KEY TO PLAY"
125 IF INKEY$="" THEN GOTO 125
146 X1=25:Y1=20:X2=100:Y2=20:A$="A":B$="6"
150 PRINT@832,"PLAYER 1:";S1;TAB(40);"PLAYER 2:";S2
155 IF POINT(X1,Y1)=-1 THEN GOTO 1100
160 IF POINT(X2,Y2)=-1 THEN GOTO 1000
161 SET(X1,Y1):SET(X2,Y2)
165 C$=INKEY$
170 IF C$="W" OR C$="X" OR C$="A" OR C$="D" THEN A$=C$
175 IF C$="4" OR C$="8" OR C$="6" OR C$="2" THEN B$=C$
180 IF A$="W" THEN Y1=Y1-1
185 IF A$="X" THEN Y1=Y1+1
190 IF A$="A" THEN X1=X1-1
195 IF A$="D" THEN X1=X1+1
200 IF B$="8" THEN Y2=Y2-1
205 IF B$="2" THEN Y2=Y2+1
210 IF B$="6" THEN X2=X2+1
215 IF B$="4" THEN X2=X2-1
220 GOTO 155
1000 S1=S1+1:GOTO 1110
1100 S2=S2+1
1110 NEXT T
1120 CLS
1130 PRINT"PLAYER 1:";S1:PRINT"PLAYER 2:";S2
1140 A$=INKEY$
1150 IF A$="Y" THEN RUN
1155 IF A$="N" THEN CLS:END
1160 GOTO 1140
```





Lander:
By Damien Berril and Simon Cooper.
You have to land your damaged freighter onto the docking platform.
You can go up with the space bar and left/right with ‹ and ›.

```
0 REM *** LANDER 17/11/83 **
10 CLS:GOTO 185
100 CLS:CLEAR 1000:Y=30:Z=30:S=5000
105 PRINT@960,STRING$(60,".");
110 REM
115 FOR X=1 TO 15 STEP 0.05:PRINT@INT(X-0.05)*64+Y,"   ";
120 A$=INKEY$:IF A$="," OR A$="." THEN B$=A$
121 IF A$=" " THEN B$="":IF X>1 THEN X=X-0.2
125 IF B$="," AND Y>5 THEN Y=Y-1
130 IF B$="." AND Y<55 THEN Y=Y+1
140 PRINT@INT(X)*64+Y,"=O=";
145 Z1=Z
150 Z=Z+RND(3)-2
155 IF Z<1 THEN Z=1 ELSE IF Z>55 THEN Z=55
160 PRINT@960+Z-1,".-----.";
161 PRINT@0,"SCORE :";S:S=S-10:IF S=0 THEN GOTO 175
165 NEXT X
170 FORR=0TO60:PRINT@R,"-";:NEXTR
175 FORR=1TO500:NEXTR:CLS
180 IF Y>=Z AND Y<Z+2 THEN PRINT"LANDED" ELSE PRINT"CRASHED"
185 PRINT"PRESS ANY KEY TO PLAY"
186 PRINT" G AND J TO CONTROLL SPACE FOR THRUST"
187 A$=INKEY$
190 IF INKEY$="" THEN GOTO 190
195 GOTO 100
```



Life:
By Damien Berril, Stuart Mundell, Gary Wick, and Simon Cooper.
This game has a funny name and we are not sure how we arrived at it. The idea of the game is to 'live' as long as you can dodging the obstacles.

The keys are:

```
   8
4  6
   2
```

The only rule is not to bump into anything other than black on the screen.

```
0 REM *** LIFE  16/11/83 ***
10 CLS:GOTO 235
100 CLS:X=20:Y=70:B$="2"
110 FORR=0 TO 120:SET(R,0):NEXTR
111 FORR=0 TO 47:SET(120,R):NEXTR
112 FORR=120 TO 0 STEP-1:SET(R,47):NEXTR
113 FORR=47 TO 0 STEP-1:SET(0,R):NEXTR
150 FORT=1TO1000
155 SET(RND(120),RND(45))
165 C$=INKEY$
170 IF C$="2" OR C$="4" OR C$="6" OR C$="8"THEN B$=C$
175 IF B$="8" THEN X=X-1
180 IF B$="2" THEN X=X+1
185 IF B$="4" THEN Y=Y-1
190 IF B$="6" THEN Y=Y+1
195 IF POINT(Y,X)=-1 THEN GOTO 230
210 SET(Y,X)
220 IF Y=X1 AND X=Y1 THEN S=S+1:GOTO 230
225 NEXT T
230 FORR=1TO500:NEXTR:CLS:PRINT"SCORE :";T
231 A$=INKEY$
235 PRINT"PRESS ANY KEY TO PLAY"
240 IF INKEY$<>"" THEN GOTO 100
245 GOTO 240
```

Dodge:

By Simon Cooper, Danny Collar, Stuart Mundell, and Tony Fitz Simmonds.
You are happily sailing down the 'Thames' when some twit starts throwing logs into the water. You have to dodge the logs for as long as possible to get a high score.
The keys are: ‹ and › (by the space bar).

```
0 REM *** DODGE 16/11/83 ***
10 CLS:GOTO 550
90 CLS
100 Z=30:S=0:B$=""
101 Q=RND(50)
105 A$=INKEY$:IF A$="," OR A$="."THEN B$=A$
110 IF B$="," AND Z<>5 THEN Z=Z-1
115 IF B$="." AND Z<>50 THEN Z=Z+1
120 IF PEEK(15360+Z)<>32 THEN GOTO 500
121 PRINT@Z,"V";
122 S=S+1
125 PRINT@960+Q,"*******"
130 GOTO 101
500 FORR=1TO500:NEXTR
510 PRINT"SCORE :";S
550 PRINT"PRESS SPACE TO PLAY"
551 A$=INKEY$
555 IF INKEY$<>" " THEN 555
560 GOTO 90
```



Ball Simulation:
By Simon Cooper and Richard Homerstone.
This programme simulates a ball bouncing off a wall. The absence of the wall was a technical fault (in other words we forgot it). You have to type in a velocity and the programme does the rest. Velocity ranges from 1-8.

```
0 REM ** BALL BOUNCING 06/10/82 **
100 CLS:INPUT"VELOICITY :";V:CLS
105 Z=V:H=1:X=0:Y=0
110 ON ERROR GOTO 130
115 RESET(X,Y+20)
120 X=X+1:V=V+0.6:Y=Y+V:IF Y>15 THEN V=-V
125 SET(X,Y+20):FORR=1TO10:NEXTR:GOTO 110
130 FORR=1TO500:NEXTR:RUN
```



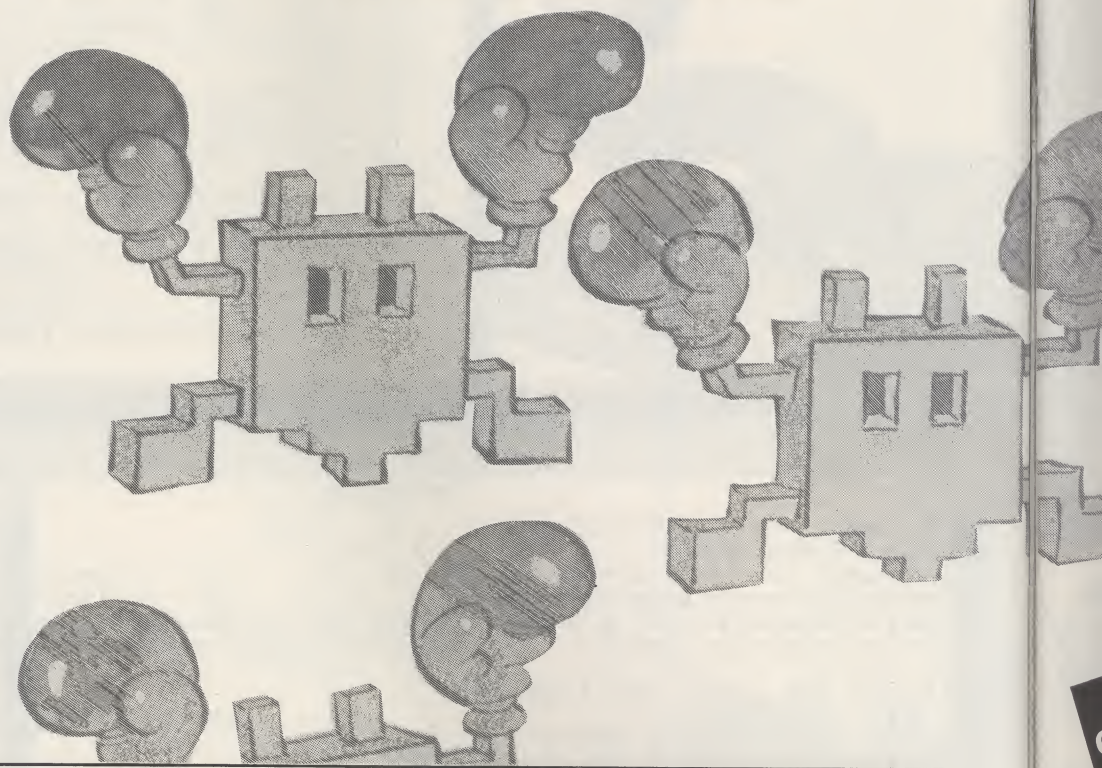
ROCKMAN FILES

A few mistakes crept into our first issue of games computing, but this list should put all of them to rights.

Case History 1

64 Invasion

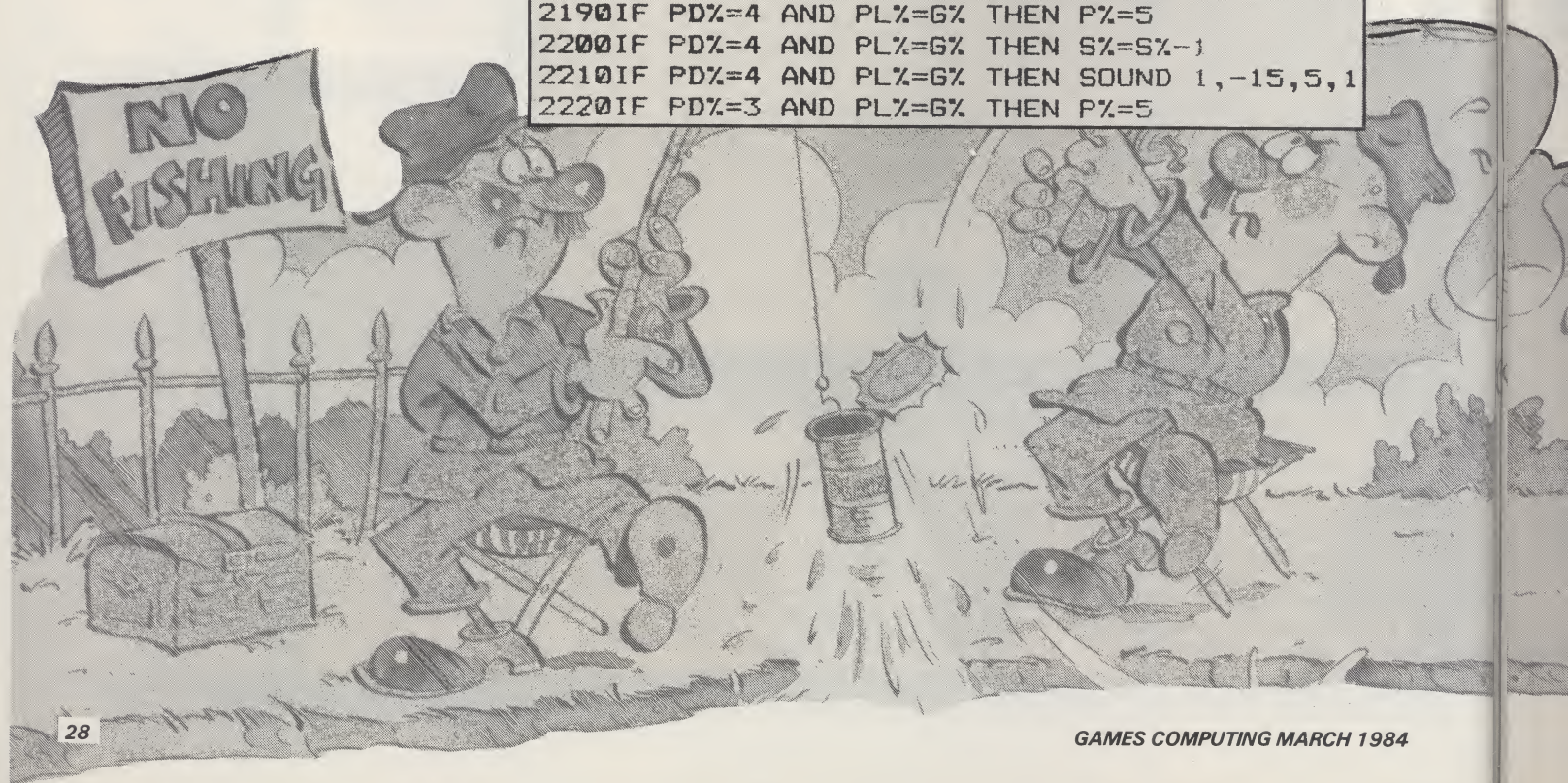
a) The RUNdown was a little confused because some lines had been deleted and others moved between going to press and putting the finishing touches to the program. Line 90 did not disappear but was moved to line 235.
b) The control keys for moving your laser base are:-
L for left movement.
; for right movement
SHIFT to fire.
c) Program 1 needs the following changes.
500 POKE43,0:POKE44,8:POKE45,0:
POKE45,223:SAVE"M/C.64":F=1
510 POKE43,1:POKE44,8:POKE45,152:
POKE46,47
680 IFR$="Y"THEN700
d) This program had such a lot of DATA that it is very difficult to type it all in correctly first time so here is a hint to help you if you get a ?ILLEGAL QUANTITY ERROR IN 150:-
RUN the program and then when the error appears enter (without a line number).
PRINT 20000+10*(((P+I)−20480)/8)
This should give you the approximate line number of the error.



Case History 2

Fisherman Fred
a) Here some lines were missed out, so this is the listing for the PROC to move pike.

```
2130DEFPROCPIKEMOVE
2140COLOUR 2
2150PD%=PD%+1
2160IF PD%=5 AND PL%=G% THEN P%=5
2170IF PD%=5 AND PL%=G% THEN S%=S%-1
2180IF PD%=5 AND PL%=G% THEN SOUND 1,-15,5,1
2190IF PD%=4 AND PL%=G% THEN P%=5
2200IF PD%=4 AND PL%=G% THEN S%=S%-1
2210IF PD%=4 AND PL%=G% THEN SOUND 1,-15,5,1
2220IF PD%=3 AND PL%=G% THEN P%=5
```



Case History 3

Snake Trap

a) Some how we missed out the loader program, so although the program runs the monsters don't look like monsters and the snake is very unserpentine. Here we present the missing loader.



```
10 POKE36879,25
20 PRINT"■■■■■■■■■■SNAKE TRAP"
30 PRINT"■■■THIS IS THE FIRST OF ATWO PART PROGRAM."
40 PRINT"■■PLEASE WAIT UNTIL THE CHARACTERS ARE DEFINED"
50 POKE52,28:POKE56,28:CLR
60 FORI=7168TO7679:POKEI,PEEK(I+25600):NEXT
70 FORC=7432TO7495:READA:POKEC,A:NEXT
80 PRINT"■■    INSTRUCTIONS":PRINT"    ──────────"
90 PRINT"■GUIDE SUICIDE SNAKE   THROUGH THE MAZE TO   EAT THE RATS■"
100 PRINT"AVOID THE MONSTERS    - THEY ARE INSTANT    DEATH!"
110 PRINT"■ONCE THE SNAKE STARTS TO MOVE YOU CAN ONLY  GUIDE HIM";
120 PRINT" - HE WON'T  STOP"
130 PRINT"■USE KEYS S,X,.,/"
140 PRINT"■■TO CONTINUE PRESS     RETURN."
150 PRINT"■LOAD■■■■"
160 DATA0,0,2,31,60,252,0,0,62,66,153,165,165,153,66,62
170 DATA12,63,113,224,224,113,63,12,48,252,142,7,7,142,252,48
180 DATA102,66,195,195,102,126,60,24,24,60,126,102,195,195,66,102
190 DATA60,126,219,255,90,90,153,165,255,255,255,255,255,255,255,255
```

Case History 4

Laser Practice

a) Not a lot wrong with this one but we did manage to miss a few bytes off the ends of lines. The complete line should look like this:-

```
27060 POSITION 2,8:?£6;"score ";SCORE(CHAR): FOR XT=0 TO 10
```

and

```
27070 FOR I=0 TO 250 STEP 7:SOUND 0,I,10,8:POKE 710,I:NEXT I
```

HINTS AND TIPS — Commodore 64.

If you've seen games like Neoclyps of Revenge of the Mutant Camels you may have wondered how the programmer has managed to get the side-ways movement so smooth. Well the 64 has some very ingenious trick hardware to make the programmers life easier. The two key locations for scrolling are 53265 and 53270. This little program shows how it is done:-

```
10 PRING CHR$(147)
20 A$="X":FORX=1TO39:B$=B$+A$:
   NEXT
30 PRINTB$
40 FORX=1TO23
50 PRINTA$+SPC(37);A$:
   NEXT
60 PRINTB$;CHR$(19)
70 FORX=-7TO7
80 POKE53265,24+ABS(X):FORD=1
   TO25:NEXT
90 NEXT
100 FORX=-7TO7
110 POKE5327,200+ABS(X)
115 FORD=1TO25:NEXT
120 NEXT
125 GETA$:IFA$E""THEN70
130 POKE53265,27
140 POKE53270,200
```

The important lines are lines 80 and 110. The values of 24 and 200 make sure that all the bits that must not be changed are left alone. Lines 130 and 140 restore normal values.

Another neat POKE is POKE650,128 and it makes all keys auto-repeatttt!





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PUZZLES



1. Heads You Win

A boy has two coins in his pocket the total value of which is fifty-five pence. One coin is not a five pence piece. What are the two coins?

2. Microprocessor

How many words can you make from 'microprocessor' using the letters only as often as they appear above. Words must be:

1. English
2. not a proper name
3. singular or plural
4. at least two letters
5. found in any small dictionary

Rating: 75 — average
100 — good
over 130 — excellent (or your spelling is dreadful)

Send us your list and the winner will receive a pocket dictionary.

3. Who Wants To Be A Dull Boy, Then?

Can you turn WORK into PLAY in seven steps, each play being a recognisable English word, and then return to WORK in the same number of steps using different words?

WORK	PLAY
————	————
————	————
————	————
————	————
————	————
————	————
PLAY	WORK

4. TROUBLED WATERS

$100 + 3 \times 9 + 2 \times 12 + 1 \times 5 + 2 \times 15 - 1 \times 17 + 1 \times 5 =$

If you work out the above sum on your calculator you will come up with an 8 figure number which could be worth a lot more.

5. Computer Log

Concealed in the grid are more than forty types/names of computers. How many can you find?

N	O	R	T	C	E	L	E	X	E	P	S	A	N	Y	O
I	E	Z	H	T	I	N	E	Z	M	O	C	S	A	N	C
L	M	X	A	M	N	I	H	V	I	H	B	C	I	R	O
R	R	E	Q	O	R	A	A	A	R	M	B	I	M	J	M
E	B	I	U	D	E	R	L	X	P	O	O	V	B	U	M
M	A	G	A	E	L	B	G	E	N	I	E	T	R	P	O
T	B	H	R	L	L	W	T	P	I	R	A	T	A	I	D
O	B	T	I	A	C	E	E	R	F	P	C	A	P	T	O
C	A	Y	U	W	X	N	D	A	I	E	O	N	P	E	R
I	G	O	S	A	L	C	I	N	P	T	R	D	L	R	E
R	E	N	S	N	D	R	O	S	T	S	N	Y	E	E	W
P	S	E	R	G	E	D	R	A	G	O	N	Y	N	O	S
A	P	E	A	C	H	T	R	E	E	X	E	N	U	R	P

6. Your Number's Up

What is the next number in this series?

1, 18, 4, 13, —

7. Jumble Sale

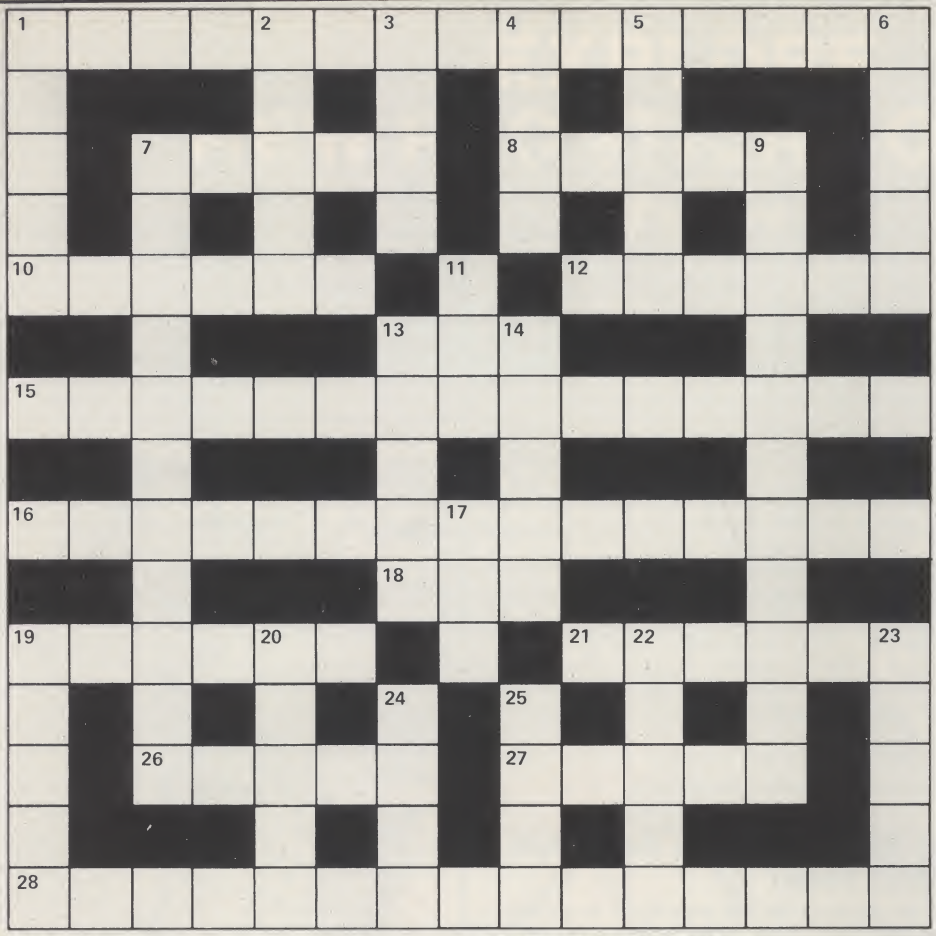
Rearrange the following words or phrases into words that will be familiar to a gamesperson.

SAVED IN SCRAPE!
TIM GUN GOES CAMP
CRIMINAL SUSPECT 'R'
MOOD CROME



8. Ferry, Ferry Interesting

Bogus the Booby, Grand Knight to the king of Falkovia was returning from the Crusades. Aware that the kingdom had been ravaged by plague and pestilence and that the people were starving he had traded his horse for supplies. As usual, Bogus, never a man to get the better of a trade, had received in return, a chicken, a basket of seed and a fox. Unfortunately he was now confronted with a problem that he thought was impossible to solve. Sitting on the banks of the River Ella he wondered how he could transport all three items across the river. The small boat at his side would only take him and one other item at a time otherwise it would sink. As we know, foxes eat chickens and chickens eat corn. Was it possible for him to get everything across to the far bank without any of the items being gobbled up?



Clues Across
1; Two o clock — in the Middle Ages? (8,7.)
7; Musical instrument — a loud guitar...? (5)
8; ... Accompanied a song. (5)
10; Wanted — unruly toughs! (6)
12; 25 joins the Navy and makes a comeback. (6)
13; Solitary fox? (3)
15; 1.6666* is the answer — now what's the question? (3,7,2,3.)
16; 3.162278? (6,4.2.3.)
(ed's note — please check.)
18; Something wrong in the Cosine Tables? (3)
19; Where such tables are used. (6)
21; Two such groups make one 6 down. (6)
26; Member of family holds 101 — member of family. (5)
27; Jolly name. (5)
28; Geometric progression that ends at 84. (5,5,5.)

Clues Down
1; Numbers of games. (5)
2; Sense — uncouth? (5)
3; 6 is but 23 isn't! (4)
4; Almost complete vacancy. (4)
5; Almost unsure of her profession. (5)
6; Two 21's. (5)
7; Plus one makes ten thousand. (4,7.)
9; 25dn. or scout-master of his subject? (6,5.)
11; Name to measure. (3)
13; Rows — and the sound of what they end in? (5)
14; 500 + 1 + 5 = a County. (5)
17; 51 + 0 = less friction. (3)
19; 2 of them make 6. (5)
20; 7 stars? (5)
22; Number of rowers? (5)
23; And 2 of this makes 19. (5)
24; It aint in favour of this. (4)
25; Honest feature of 12 and 9. (4)

9 Falkovia Rules

All were saved. With his one free go the Duke must open the door marked MF. If he extracts a son, he can safely assume that cell contains another son, since he knows it is incorrectly marked. It then follows that as there is only one son left to locate, and three daughters, that the cell marked FF contains a son and daughter. His two remaining daughters are in the cell MM. Foiled again said the king — and good job too.

Answers — For *March* edition

1 Blind Date could well be the title of the book of the year, but instead it is of course '1984' written as one thousand nine hundred and eighty four ad.

2 **It was a bright cold day in April** and the clocks were striking thirteen. Is the first line of '1984'. The sequence shown is actually the read out of a digital clock, at thirteen o'clock, one minute past etc. So the sequence continues . . .

3 **War is Peace**
SOFT — SORT — SORE — WORE — W A R E

4 **Telescreen**
The two words are

P R O G R A M
L I S T I N G

5 **Winston Smith**
The letters are the initials of the months of the year and continue J A S O N

6 **Doublethink**
He was buying numbers for his front door.

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GAMES MACHINE

SOFTWARE

PERILOUS POST

Made by: Impact Software
Runs on: VIC 20
Price: £6.50

Deliver letters Frogger-style in this game, where your joystick controls the postman's van. Initially, you have to avoid hedges(?) to get to the railway track. Two trains continuously whizz along and more often than not, devour your van as you try to leap in between.

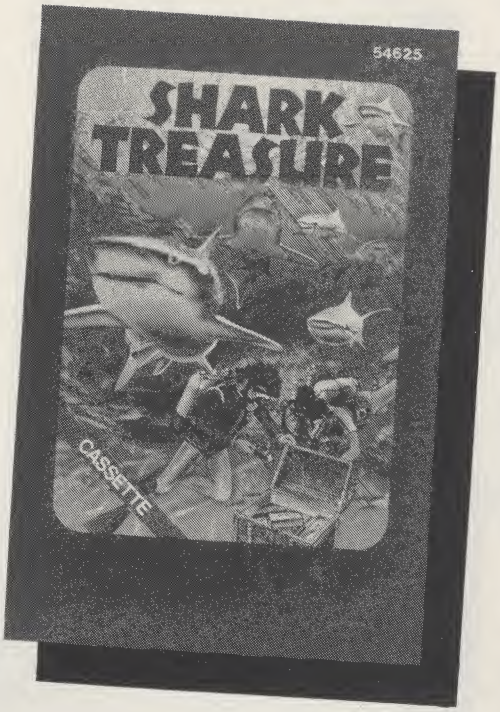
Inane comments such as "Too bad" and "One left" are accompabnied by an irritating ditty which make you pause to contemplate your frustration, before trying again.

The railway section now mastered, you have to cross the river by hitching a ride on the boats, but strategically placed bushes complicate your landing. Once across, traffic wardens have to be dodged as you aim for the flashing house. Pressing FIRE delivers your letter.

During the course of the game, a sunflower appears, to enable you to live the motorists' dream. For while the flower is on the screen you can run over the wardens and gain bonus points.

Control by joystick is simple, although it is all too easy to continue moving when you really mean to stop. Graphics are reasonable and sound well deployed.

If you enjoyed Frogger, then you will enjoy 'Perilous Postman'.



SHARK TREASURE

Made by: Dragon Data
Runs on: Dragon 32
Price: £7.95

Shark Treasure is an arcade type game in which you control divers using the joystick collecting treasure from the lost galleon (which is nver seen), the Santa Maria. Each dive costs $1000 and each gold treasure bar is worth the same. Your search leaves you with $2000 and the game ends when you have no money left. Easy! But then I haven't mentioned the monster sharks between you and the treasure.

Up to a maximum of six will swim horizontally across your path and will eat you if you come within range. These monsters make the program, in very good graphics (you can even see their teeth) but I do feel the diver and the lack of background graphics (ie. the Santa Maria) let the program down. All in all a good game but not addictive enough to live up to a true arcade buff.

KRAZY KOPTER

Made by: English Software
Price: £5.95

It's a year of living dangerously and Krazy Kopter provides you with enough deathly attacks to wish you'd never put this Atari cassette into the cassette player, but stick with it — it becomes challenging too.

You are at war with a neighbouring country and two of your top secret agents have been captured. With the aid of a hi-jacked green army truck your buddies set off across the canyon's bridges to home-base.

This is where you come in and have a chance to display your skills. Grab your helicopter controls and navigate them safely home. In hot pursuit though, are the enemy's cars who are determined to halt your chances of freedom, blast them by pressing the joystick button and do not allow them to reach the other side of the bridge. If you do you will be frozen to the spot as a navy missile of lethal force homes in on you.

When you hit a car it changes colour and starts moving in the opposite direction. Be sure and watch the other bridges because the cars appear randomly on all three. Beware of the narrow canyons ridges on the lower bridge as crashing into its side will mean instant death and one less helicopter.

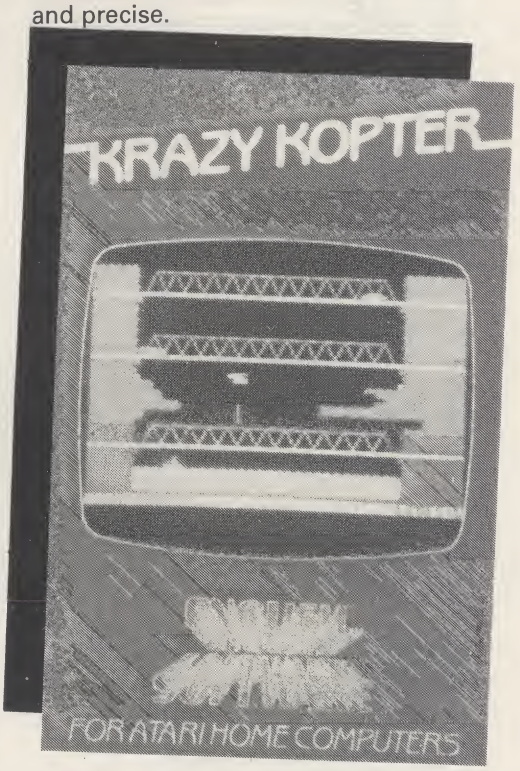
At the pit of the canyon a river flows where the enemy's ship patrols firing frantically when you come within its range leaving you and your helicopter to plummet down into the deepest waters.

As you progress to each level the play becomes faster with level three presenting a real challenge, a triangular-shaped UFO darts around the screen moving upwards. It's a question of zap or be zapped if it reaches the top of the screen.

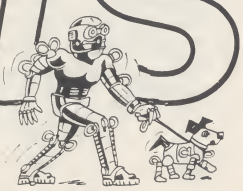
The graphics inspire a certain amount of realism especially when your helicopter crashes into the water, and the colours are bright and lively.

Although at first the game seemed difficult, after a short while you are able to anticipate relatively accurately where the cars will appear and you can dart around the screen and deal with the mission in hand.

This tape loaded first time with no hitches and the instructions were clear and precise.



REVIEWS



SOFTWARE

INVADERS

Made by: Arcadia
Price: £5.50

If you're after a space invader type game then you won't go far wrong with this one.

Although it's not a new game concept it's nevertheless one that almost any arcade player will want in his or her library. Invaders needs no explanation at all about the game play. But what I can say about this version is that the graphics are good, the explosions and whizz bangs are just fine and it sticks quite faithfully to the original arcade game.

It is not the most exciting game I've ever played but one thing in its favour is that it loads very easily — and that's a big plus if you're an Oric owner. One important flaw with the game though is that you have to turn off the computer in order to clear the screen.

LASER COMMAND

Made by: Program Power
Runs on: BBC Micro
Price: £5.95

The cassette arrived with a sheet of photocopied instructions which left something to be desired. Options included one or two players, ten skill levels, choice of alien bomb etc.

The cassette loaded first time and onto the screen was printed "Laser Command for Micro Power" (which was somewhat strange). The keys chosen for control, an important factor, were not brilliant but were adequate.

The game was well presented, the object being to destroy the alien fire in defence of your six cities. Defence was in the form of mines which could be detonated immediately or left for later use. The game, though slightly mystifying at first, proved to be extremely playable. A high-score table was sorely missed, however graphics and sound were well used and although my high-score was negligible, 16000, I am sure that with practice others will easily surpass this.

SPLAT

Made by: Incentive Software
Runs on: Spectrum 48K
Price: £5.50

Here is one game I shall play and play for ages. Once again we are in the middle of a maze and once again we must find our way out. And to gain bonus points objects must be collected en route.

This time the hero is Zippy and the objects are plums and grass. Zippy has to avoid the spikes and walls, and must not run off the screen. The problem here is that not only does Zippy race around the maze but also the maze moves around Zippy! True, it is quite slow when Zippy zips, and it changes direction when you least expect it, but it is very difficult to navigate through a maze when walls sneak up on you from behind. The Spectrum screen seems suddenly very small and crowded.

The game has been well thought out by the programmer. For example you have the choice of using two brands of joystick, or the cursor keys, or defining your own keyboard control, and use of the Enter key causes the game to pause indefinitely while you go for a cup of coffee. The game is graphically well presented and a pleasure to play.

CHOPPER

Made by: Sumlock
Runs on: VIC 20
Price: £6.95

Chopper is another really exciting Sumlock game, well nearly! All you have to do is destroy the enemy convoy by bombing them, and not being shot by the "anti-aircraft gun". You can also be killed by heat seeking missiles, but these you can easily avoid by enploying dodge tactics.

Another way to meet your maker is by trying to pay him a visit i.e. disappearing off the top of the screen. Crashing into canyon walls is also unadvisable. The canyon walls are not exactly foolproof either because if both sides are bombed in the right places and you are careful where you go, you fly off the sides. The graphics are about average but the sound could be improved. Nevertheless I would recommend most games players take a good look at this one as it is fun to play.

SHIP OF THE LINE

Made by: Richard Shepherd Software
Runs on: Commodore 64
Price: £5.95

A variation on the theme of being a ruler of a kingdom and trying to use your resources for the benefit of your people. This game casts you in the role of a midshipman in charge of a 17th century ship of the line. You are prompted for orders after being given an update on your current condition, of men, ammunition, and supplies.

From time to time your lookout spots enemy ships on the horizon which you can either do battle with or attempt to run from. During these battles you inevitably lose men and use up your ammunition supply. The trick is to manage your ship without running your supplies and ammunition too low or losing too many men before returning to port for replenishment. It is on



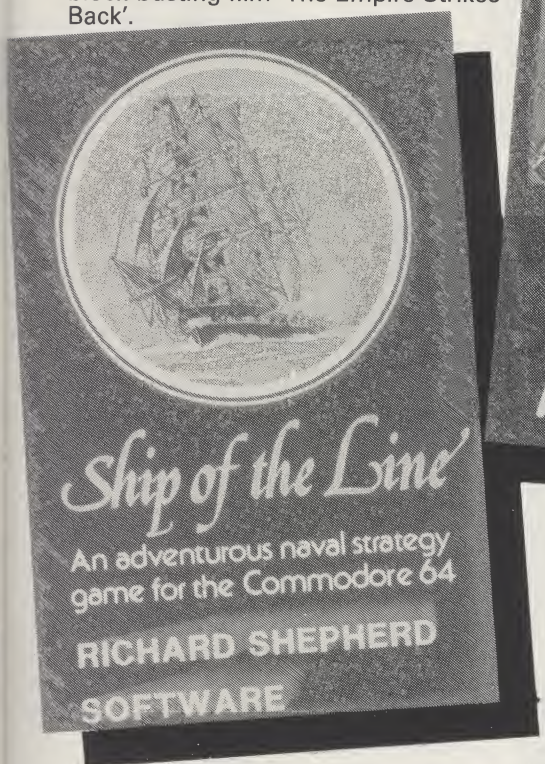
these returns to port that you can be promoted through the ranks if you are doing a good job.

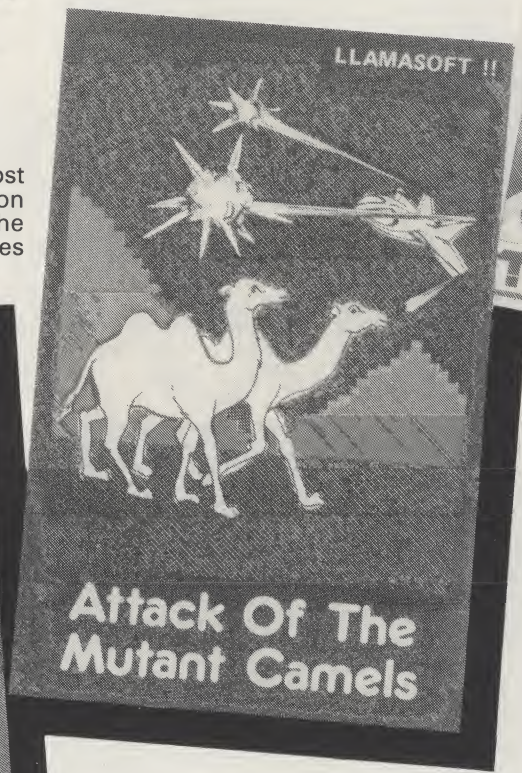
You are also faced with various random problems from being becalmed to a mutiny just to keep you on your toes. The requirements to key all instructions in text form soon becomes tedious and I feel that commonly used instructions could have been allocated to function keys. However an interesting game with simple but effective use of sound and graphics.

ATTACK OF THE MUTANT CAMELS

Made by: Llamasoft
Price: £5.50

This surely must be one of the most imaginative of games software now on sale and is doubtless inspired by the block-busting film 'The Empire Strikes Back'.





The sequence from which the game is taken is when Luke Skywalker has to destroy 90' tall mutant camels. You must fly close to the camels in order to progressively weaken their shields with your fire to make them disintegrate. As you weaken their neutronium shields they change colour from white to red, then to blue and finally back to white, before vanishing from the screen.

You cannot relax, however, as you are shooting the camels because they are shooting at you! The dreaded mutant camels (which are really sophisticated robots) fire standard laser bolts which steadily destroy your space craft. As pilot of the craft you must dodge the enemy fire, and if you are hit by three of the laser bolts your ship is destroyed.

Not only can the camels blow up your ship with standard type lasers they can also fire a special intermittant laser bolt of superior deadliness. For on contact with your ship it, and the space vessel, immediately explode. Nasty! Unfortunately, your only hope of avoiding these is to listen for the special tone emitted by the laser bolt.

Like most arcade style games the object of Attack of the Mutant Camels is to wipe out the aliens (in this case the camels) which confront you in waves. The camels give you up to 31 levels if you are good enough at hitting them with your own weaponry.

I found this game extremely compelling to play, perhaps one of the most addictive currently available for the Commodore 64. The action is very fast moving and the game adopts excellent use of graphics and sound. For instance there is a continual ominous sound of the marching gargantuan camels giving the game an unnerving sense of ugency to it! Well done Llamasoft.



ULTIMA ZONE

Made by: Tansoft
Price: £5.50

This game describes itself as 'a superb arcade triology'. The only bit I go along with is 'triology' as the game is split into three distinct sections; battlezone, the trap and orbit runner.

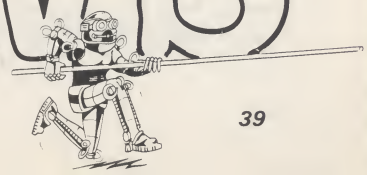
Battlezone is very similar to our old favourite, space invaders. You are defending a prison from the attacking 'walkons', if they penetrate your defences they release their mates, the brungs, who are locked in the prison. But should you successfully defend your prison from the walkons you move on to . . .

The trap. I don't know why it's called the trap, but here's what it looks like. A number of the brunes have escaped into space and you have to shoot them down, via a remote space ship. The space ship moves up or down depending on the instructions you send it using your laser communications system. When the craft is level with the escaped brunes you can give the FIRE command. Simple.

Now for the third and final part of the triology. This is a cross between two existing arcade games, Frogger and Space Lander. You have to manoeuvre your space vessel through a mass of orbiting space ships. Once safely through this you have to dodge an asteroid storm and then you have the chance to ran the alien ship kamikaze fashion. End of game!

Although I found this game interesting and the concept was rather different from most arcade games, to be honest after I had mastered the play technique I found the game boring having played it a few times.

REVIEWS



SOFTWARE

MULTIGAMES 2

Made by: Tansoft
Price: £5.50

In this pack of games you'll find five altogether, Hangman, Moonlander, Roadrace, Substrike, and 30 Link.

Hangman: takes very little explanation as the very name is so well-known. This is a version of the game played in class rooms for centuries in which you have to guess a word letter by letter and for each letter you guess incorrectly a piece of hangman's scaffolding is erected, until a man is hanged limb by limb. Hangman is still as popular as the day it was first played and now there are numerous computerised versions. In this one the computer puts a row of dashes on the screen and you have to enter the appropriate letter via the keyboard. If you don't get the right letters the computer draws a bit more until you are finally hanged.

Moonlander: Another self-explanatory game title. But if you haven't guessed what you have to do here it is. You must land a small space ship in the centre of a crater on a planet. The craft's height is displayed on the left hand side of the screen and the fuel on the right. There is a continual read-out shown at the foot of the screen giving you information about your flight path in velocity against fuel. All you must do is fire the retro's to slow the ship down using the relevant keys as directed in the instructions. If you give too much retro the ship will run out of fuel. Too little, and the ship will move far too quickly and smash into the surface of the planet. With practice you'll soon learn what the correct balance between retro, velocity and fuel is and you'll be able to land the craft safely. This must surely be one of the oldest computer games around but has a strong following of fans today.

Roadracer: this is a straight version of another old favourite with computer games programmers. You control a car taking part in a car rally. The car has to be manoeuvred along the roadway which involves some nifty steering wheel work in order to successfully negotiate some hazardous bends, never mind the logs piled up intermittantly along the road. If you hit too many trees or drive off the road your car crashes and whoops, you're dead.

Substrike: Now you take the role of an aircraft carrier which is fleeing a fleet of enemy submarines. As the commander of the carrier you must drop depth charges at what you judge to be suitable moments to go off when a submarine is passing. You only have two minutes in which to destroy as many submarines as possible.

To sum up the entire tape of games, I think it was commendable of Tansoft to compile this quality of games on one tape. Usually a compendium of games put together on one cassette are not of very good quality, although you get more for your money, but now that there is a lot of Oric software about users will probably opt for a more sophisticated version of the above games.



PENNY SLOT

Made by: Interceptor Micro's
Runs on: VIC 20
Price: £4.50

If you have ever wanted your own fruit-machine, or if you are thinking of joining Gamblers Anonymous, then this is the program for you. Excellent graphics combined with all the features you would expect to find on your own fruit-machine make this a superb package. My only misgiving for this game is its ability to hold your interest for any length of time.

The graphic construction of the reels is terrific, and once RETURN has been pressed a real rolling action is depicted. HOLD and NUDGE are randomly allocated, and selected by keys 1 to 3 for the appropriate reel. Nudging time quickly disappears, and it takes some practice to gain the most from your nudges.

On the financial side, you start with 20 pence, and each press of RETURN costs 1p. Winning combinations are displayed at the beginning of the program and follow traditional slot machine standards.

Maybe I am just very lucky, but I have not yet managed to lose all my money on this game (the only REAL departure from the genuine article!) but should you be unfortunate the space-bar restores your fortune.

Sound is imaginatively deployed to alert you to a win, nudge or hold, and rounds the game off nicely. This game is good value for demonstrating the graphic ability of your VIC.



REVIEWS

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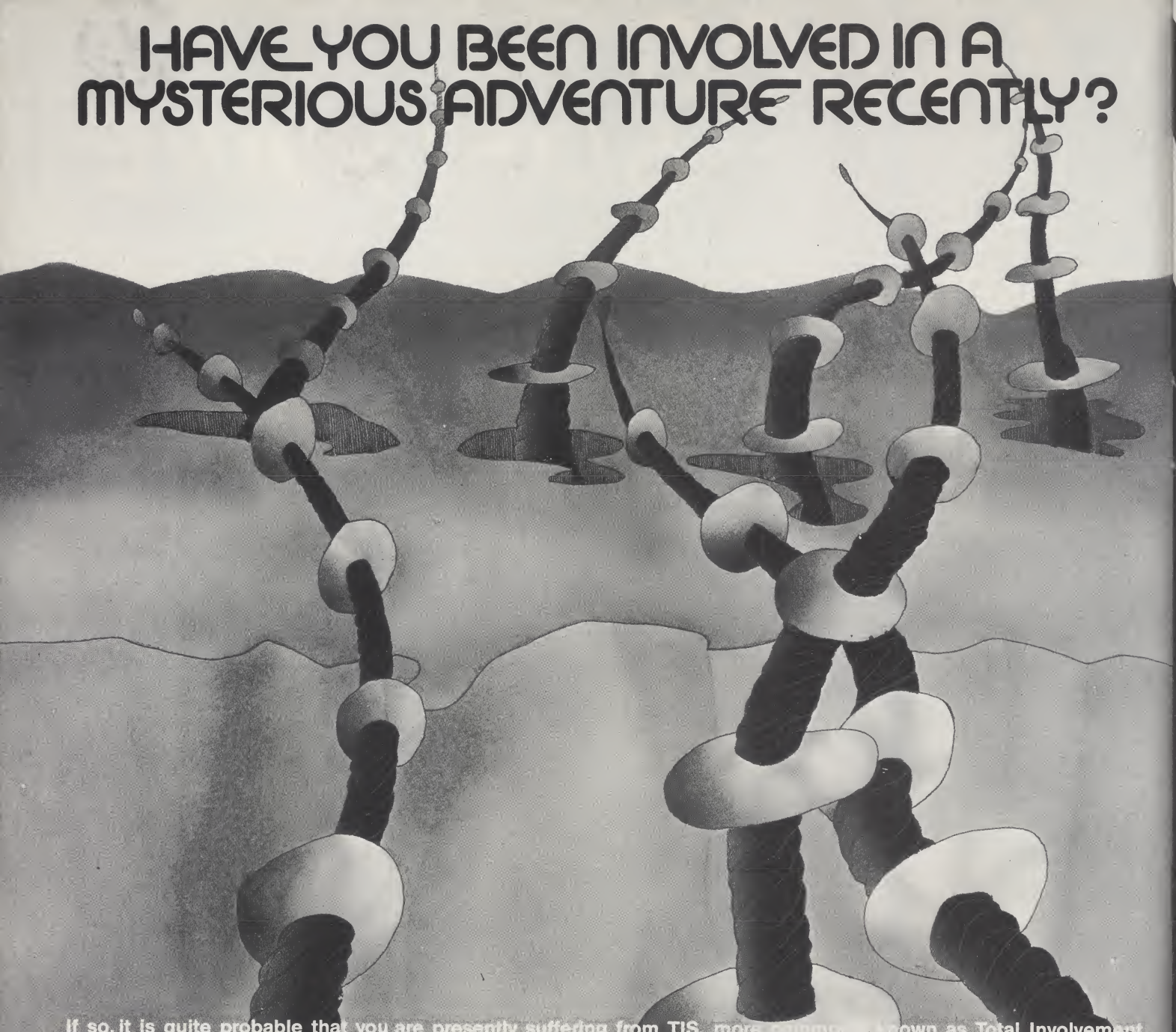
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TIS manifests itself in a number of ways, one of the most dramatic symptoms being a victim's complete inability to feel at ease in the world of reality. Other symptoms include insomnia, a desperate need to play a Mysterious Adventure, and an overwhelming sense of acute enjoyment.

Experts believe that TIS is usually contracted as a result of prolonged exposure to Mysterious Adventures, this is commonly caused by owning any of the following Home Computers:-

48K SPECTRUM, BBC MODEL A OR B, TRS80, COLOUR GENIE, ATARI 400/800, COMMODORE 64, DRAGON 32, 16K ZX81, LYNX etc.

When questioned about this epidemic, a representative of DIGITAL FANTASIA, a company who are actively involved in research and development work on Mysterious Adventures said, "There is probably no cure for TIS other than mains failure, faulty RAM chips etc. which can be at best only a Temporary solution". "In the absence of a more permanent cure, I would advise TIS sufferers to submit to the Syndrome and obtain Mysterious Adventures from any sources available to them". "TIS is highly contagious and in view of the current Worldwide Epidemic, I would say enjoy it while you can, resistance is futile".

If you have a BBC Computer or a 48K SPECTRUM, you can obtain Mysterious Adventures direct from DIGITAL FANTASIA in any of the following dosages:-

1) THE GOLDEN BATON
2) THE TIME MACHINE
3) ARROW OF DEATH (PART 1)
4) ARROW OF DEATH (PART 2)
5) ESCAPE FROM PULSAR 7
6) CIRCUS
7) FEASIBILITY EXPERIMENT
8) THE WIZARD AKYRZ
9) PERSEUS AND ANDROMEDA
10) TEN LITTLE INDIANS

Each Dose costs £9.95 including V.A.T. and Postage. Excellent quantity Discounts are available for Pushers.

D.F. MENTAL HEALTH WARNINGS. MYSTERIOUS ADVENTURES CAN SERIOUSLY DAMAGE YOUR SENSE OF REALITY.

SEND CHEQUE OR P.O. TO:

DIGITAL FANTASIA

ECK ROAD, NORBRECK,
L, LANCS. FY5 1RP.
591402



The bomber program (just like all the rest of my programs) is extremely user-friendly and therefore requires very few instructions, which are:-

1) When you wish to drop a bomb, press any key and a bomb will be dropped.

2) When you wish to stop a bomb from moving vertically press the 'I' key and the 'rept' key simultaneously, this will cause the bomb to move in a parallel line in relation to the plane. Once the 'I' and 'rept' keys have been released, the plane will start moving in a downward direction again.

Suggestions For Improvement

I have got two main suggestions for improvement, which are:-

1) At the moment the Low-Resolution graphics mode (40*40) is being used. It is possible to change modify the program to take advantage of the Apple's superior Hi-Res mode, if you are familiar with Hi-Res shape tables.

2) Another field where I feel that this program could be improved is the field of sound, at the moment the sounds generated are being created with the "PEEK (-16336)" command. The sound could be enhanced by replacing the above routine with a more complex one which allows custom modification for tones, and length of different notes.

I hope that you have fun, both using, and modifying my "BOMBER" game. Good Luck!

RUNS ON APPLE II

```
FUNCTION? LIST /66

0     REM BOMBER
1     GOSUB 123
2     DUN = 0
    : SCR = 0
    : TRIES = 10
3     BDX = 2
4     GR
5     SKY = 7
6     SHIP = 10
7     PLANE = 15
8     H2O = 2
9     BLAST = 4
10    BOMB = 0
11    BOOM = 0
    : BF = 0
12    GOSUB 105
13    CTR = 0
    : H = 39
    : V = 3
14    COLOR= SKY
15    FOR N = 0 TO 37
16    HLIN 0,39 AT N
17    NEXT N
18    COLOR= H2O
19    HLIN 0,39 AT 38
    : HLIN 0,39 AT 39
20    TIME = 1
21    Y = 37
    : X = 0
22    COLOR= PLANE
23    GOSUB 71
24    COLOR= SHIP
25    GOSUB 63
26    GOSUB 89
27    IF BOOM = 0 THEN 34
28    BOOM = 0
    : COLOR= SKY
29    IF SCRN( BH,Y) = H2O THEN 31
30    X = 0
    : CTR = 0
    : BDX = INT ( RND (1) * 6) + 2
31    GOSUB 80
32    IF X = 0 THEN 34
33    COLOR= SHIP
    : GOSUB 63
34    PB = PEEK ( - 16384)
    : POKE - 16368,0
35    IF PB < 127 THEN 41
36    VVEL = 0
37    IF BF = 1 THEN 41
38    BF = 1
    : BH = H - 3
    : BV = 4
39    COLOR= BOMB
40    PLOT BH,BV
41    H = H - 1
    : CTR = CTR + 1
    : GOSUB 75
42    IF CTR < BDX THEN 44
43    X = X + 1
    : CTR = 0
    : GOSUB 66
44    IF BF = 0 THEN 56
45    IF SCRN( BH,BV + 1) = SKY THEN 54
46    IF SCRN( BH,BV + 1) = SHIP THEN 92
47    FOR I = 1 TO 10
    : Z = PEEK ( - 16336)
    : NEXT I
48    PRINT "";
49    FOR I = 1 TO 20
    : Z = PEEK ( - 16336)
    : NEXT I
50    TRIES = TRIES - 1
51    BF = 0
    : GOSUB 105
52    COLOR= H2O
    : GOSUB 80
53    BOOM = 1
    : GOTO 56
54    COLOR= SKY
    : PLOT BH,BV
    : GOSUB 140
55    COLOR= BOMB
    : PLOT BH,BV
56    IF H > 6 THEN 59
57    COLOR= SKY
    : GOSUB 71
58    COLOR= PLANE
    : H = 39
    : GOSUB 71
59    IF X = 0 THEN 24
60    IF X < 33 THEN 26
61    COLOR= SKY
    : GOSUB 63
62    X = 0
    : BDX = INT ( RND (1) * 6) + 2
    : GOTO 24
63    PLOT X,Y
    : PLOT X + 1,Y
    : PLOT X + 2,Y
    : PLOT X + 3,Y
    : PLOT X + 4,Y
    : PLOT X + 5,Y
    : PLOT X + 6,Y
64    PLOT X + 3,Y - 1
    : PLOT X + 4,Y - 1
    : PLOT X + 5,Y - 1
    : PLOT X + 4,Y - 2
65    RETURN
66    COLOR= SKY
67    PLOT X - 1,Y
    : PLOT X + 2,Y - 1
    : PLOT X + 3,Y - 2
68    COLOR= SHIP
69    PLOT X + 4,Y - 2
    : PLOT X + 5,Y - 1
    : PLOT X + 6,Y
70    RETURN
71    PLOT H,V
    : PLOT H - 1,V
    : PLOT H - 2,V
    : PLOT H - 3,V
    : PLOT H - 4,V
    : PLOT H - 5,V
    : PLOT H - 6,V
72    PLOT H,V - 1
    : PLOT H,V - 2
    : PLOT H - 1,V - 1
    : PLOT H - 4,V - 1
    : PLOT H - 5,V - 1
73    PLOT H - 2,V - 1
    : PLOT H - 3,V - 1
74    RETURN
75    COLOR= SKY
76    PLOT H + 1,V
    : PLOT H + 1,V - 1
    : PLOT H + 1,V - 2
77    COLOR= PLANE
78    PLOT H - 1,V - 1
    : PLOT H,V - 2
    : PLOT H - 5,V - 1
    : PLOT H - 6,V
79    RETURN
80    REM
81    IF BH - 3 > - 1 THEN PLOT BH - 3,Y - 2
82    IF BH - 2 > - 1 THEN PLOT BH - 2,Y - 1
83    IF BH - 1 > - 1 THEN PLOT BH - 1,Y
84    PLOT BH,Y
    : PLOT BH,Y - 1
    : PLOT BH,Y - 2
85    IF BH + 1 < 40 THEN PLOT BH + 1,Y
86    IF BH + 2 < 40 THEN PLOT BH + 2,Y - 1
87    IF BH + 3 < 40 THEN PLOT BH + 3,Y - 2
88    RETURN
89    FOR D = 1 TO TIME
90    NEXT D
91    RETURN
92    COLOR= SKY
    : GOSUB 63
93    PLOT BH,BV
94    COLOR= BLAST
    : GOSUB 80
95    TRIES = TRIES - 1
    : BF = 0
    : BOOM = 1
96    IF BV + 1 = 35 THEN VL = 3
97    IF BV + 1 = 36 THEN VL = 2
98    IF BV + 1 = 37 THEN VL = 1
99    FOR I = 1 TO VL + 1
100   FOR J = 1 TO I * I * 11 + 50
101   Z = PEEK ( - 16336)
    : NEXT J
102   FOR J = 0 TO I * 18
    : NEXT J
    : NEXT I
103   GOSUB 105
104   GOTO 56
105   SCR = SCR + VL
    : VL = 0
106   PRINT "BOMBS LEFT =";TRIES;"     SCORE =";SCR
107   IF TRIES = 0 THEN 109
108   PRINT
    : PRINT
    : GOTO 122
109   DUN = 1
    : PRINT "*** GAME OVER ***2
110   PRINT "YOUR SCORE OF ";SCR;" OUT OF 30 IS ";
111   ON INT (SCR / 7) + 1 GOTO 116,115,114,113,112
112   PRINT "SUPER"
    : GOTO 117
113   PRINT "GOOD"
    : GOTO 117
114   PRINT "FAIR"
    : GOTO 117
115   PRINT "TERRIBLE"
    : GOTO 117
116   PRINT "POOR"
    : GOTO 117
117   PRINT "ANOTHER GAME?";
118   X = PEEK ( - 16384)
    : IF X < 128 THEN 118
119   POKE - 16368,0
    : PRINT
120   IF X - 128 = ASC ("Y") THEN 2
```

```
121   TEXT
    : HOME
    : END
122   RETURN
123   TEXT
    : CALL - 936
124   PRINT
    : PRINT
125   HTAB (8)
    : PRINT "**** SINK THE SHIP ****"
    : PRINT
126   PRINT "YOU GET 10 BOMBS."
127   PRINT
128   PRINT "A HIT ON THE DECK  = 1 POINT."
129   PRINT
130   PRINT "A HIT ON THE CABIN = 2 POINTS."
131   PRINT
132   PRINT "A HIT ON THE STACK = 3 POINTS."
133   PRINT
    : PRINT "PRESS THE '1' & 'REPT' KEYS TO STOP BOMB       FALLIN
        G VERTICALLY.                (NOTE.IT STILL MOVES HORIZONTA
        LLY)"
134   PRINT
    : PRINT
135   PRINT "PRESS ANY KEY TO DROP A BOMB."
136   FOR Z = 1 TO 3000
137   NEXT Z
138   RETURN
139   END
140   IF BV > 32 THEN 143
141   VVEL = VVEL + 1
    : BV = BV + INT (VVEL / 2)
    : BH = H - 3
142   RETURN
143   IF BV < 37 THEN BV = BV + 1
144   RETURN

]PR#0
```




```
]FUNCTION?

BD:   3 30 42 62
BF:   11 37 38 44 51 95
BH:   29 38 40 45 46 54 55 81 82 83
      84 85 86 87 93 141
BL:   9 94
BO:   10 11 27 28 39 53 55 95
BV:   38 40 45 46 54 55 93 96 97 98
      140 141 143
CT:   13 30 41 42 43
D:    89 90
DU:   2 109
H:    13 38 41 56 58 71 72 73 76 78
      141
H2:   8 18 29 52
I:    47 49 99 100 102
J:    100 101 102
N:    15 16 17
PB:   34 35
PL:   7 22 58 77
SC:   2 105 106 110 111
SH:   6 24 33 46 68
SK:   5 14 28 45 54 57 61 66 75 92
TI:   20 89
TR:   2 50 95 106 107
V:    13 71 72 73 76 78
VL:   96 97 98 99 105
VV:   36 141
X:    21 30 32 43 59 60 62 63 64 67
      69 118 120
Y:    21 29 63 64 67 69 81 82 83 84
      85 86 87
Z:    47 49 101 136 137

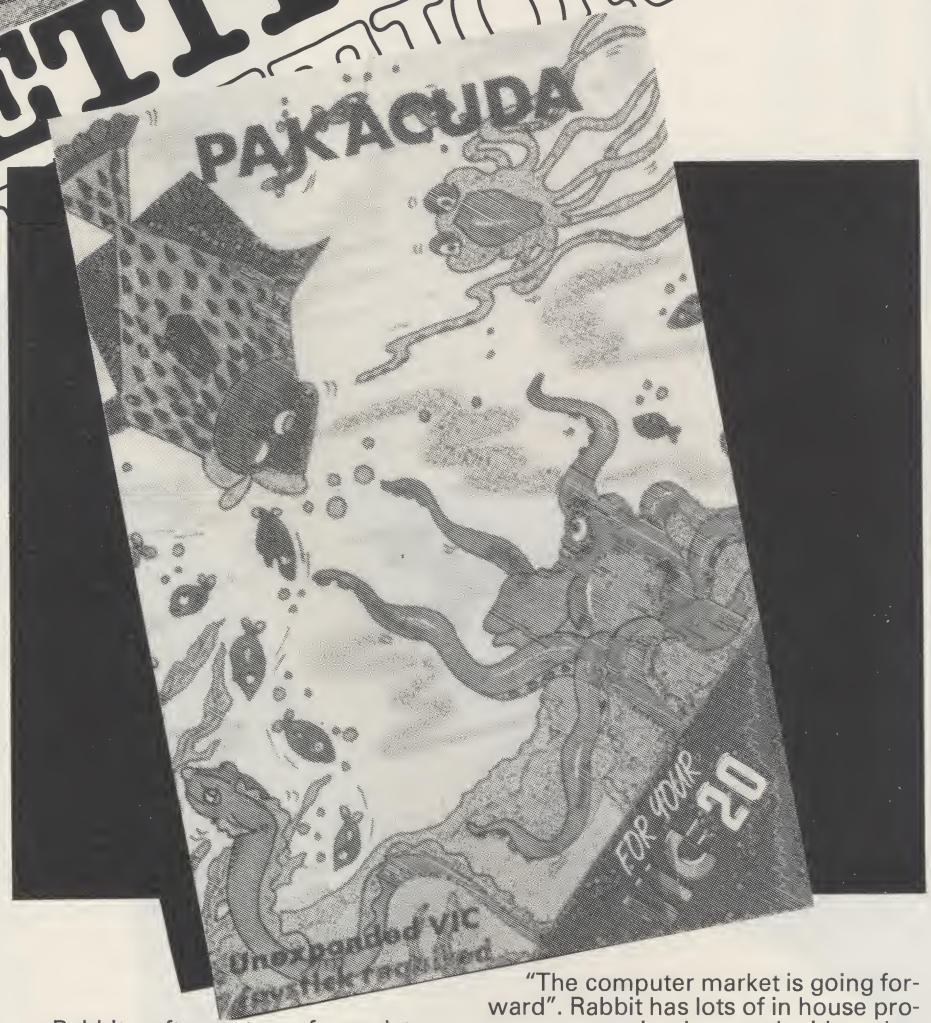
]PR#0
```





COMPETITION 1

COMPETITION 2





£1000, yes £1000 of Rabbit software can be won in our great new caption competition.

There are ten prizes on offer for the ten most apt captions for the picture on this page. Each prize jamboree pack consists of £100 worth or Rabbit software, a window sticker, and posters. The software contained in each pack is a mixed bag of software for the Spectrum, VIC 20, and the Commodore 64, so if you win you can swop (or sell) the extra software with your friends.

Rabbit software was formed two years ago and specialises in arcade games for the Spectrum and the Commodore VIC 20 and 64 home computers and have several major games brains programming for them. Rabbit's philosophy is that of new concepts.

Terry Grant, Rabbit's software manager and ideas man, says "Everybody that buys, sells, or uses software has said once in their lives 'not another space invaders'. The number of clones of well worn themes in the marketplace is amazing, but perhaps that shouldn't be the case after all most programmers are brilliant at writing programs but not so good at creating new concepts".

"The computer market is going forward". Rabbit has lots of in house programmers to implement the ideas that they are given, and this is reflected in the prizes that our 10 lucky winners will receive.

What you have to do to win

Printed on this page is a picture of a game from Rabbit Software. You must work out the most apt and amusing comment that applies to the picture. When all entries have been received the top thirty entries will be finally judged by Rabbit and the prizes will be awarded by them. Winners will be published in a future edition of *Games Computing*.

Competition Rules

1. This competition is open to all UK and Northern Ireland readers of *Games Computing*, except employees of Argus Specialist Publications Ltd, their printers or distributors, employees of Rabbit Software Ltd, or anyone connected with them.
2. As long as the correct coupon is used for each entry, there is no limit to the number of entries per person, but photocopies of the coupon will not be accepted.
3. All entries must be postmarked before 31 March 1984.
4. The prizes will be awarded to the ten entries judged to be worthy of merit by the editor and by Rabbit Software.
5. No correspondence will be entered into with regard to the competition results and it is a condition of entry that the judges decision is final.
6. The winners will be notified by post and the results will be published in a future edition of *Games Computing*.

Good Luck!

SKI-ING

Even Jean Claude Killy would find the pistes Spectrum style difficult to ski down.

When you play this Spectrum game you will find hazards such as flags that you must ski between, fences that you must skilfully jump, and barrels which you must twist and turn around to avoid.

The game has five skill levels, the level selected determines the speed at which the man comes down the slope using a PAUSE statement. As the game progresses the speed of it increases and the flags move closer together.

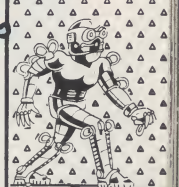
The final score depends on the length of time that you survive the course. The program doesn't contain routines for peripherals to be used e.g. joysticks, although they could be added at a later stage by modifying lines 320 to 390 accordingly.

As it stands the game is controlled using the keyboad, 0 for left, 1 for right and 9 to jump. The program is a continuous loop with a variable increasing each move, when the variable reaches a certain limit a new screen is displayed along with new hazards.

Have fun, and at least with this ski holiday you're in no danger of breaking a leg!

RUNdown

Lines	Action
10- 50	Set user defined graphics
60- 70	Data for user defined graphics
80-140	Set up the screen
160-187	Display control instructions and input options
190-630	Main program loop

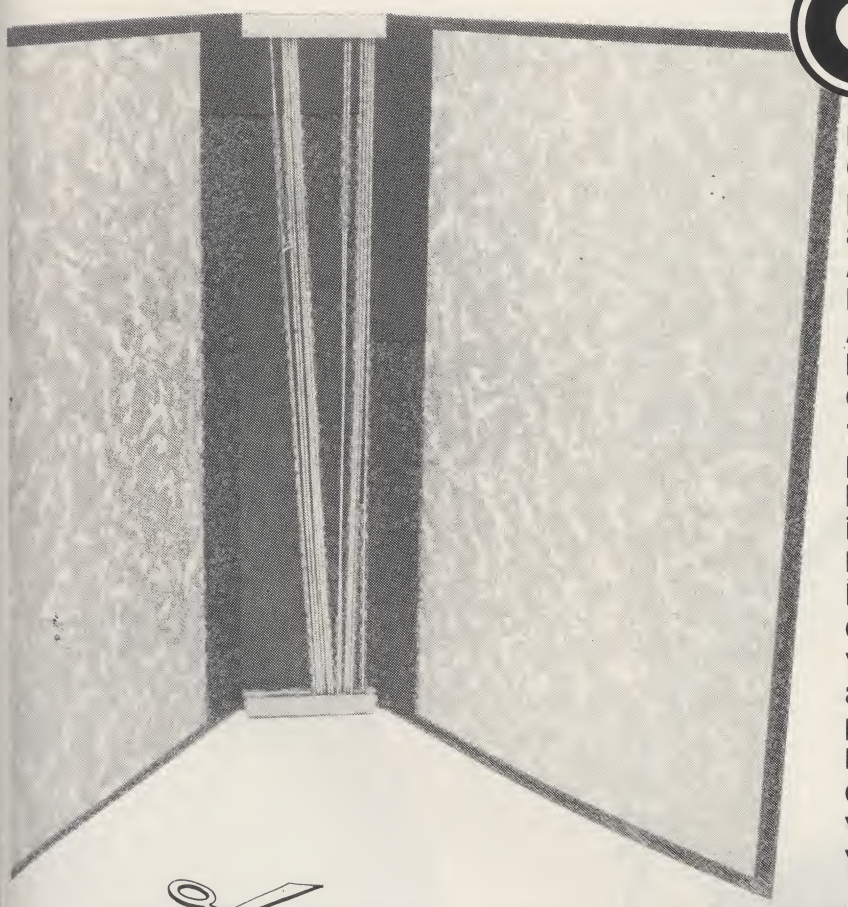



24
14


SLALOM
RACE
0:24

```
  1 LET hi=100
  10 FOR n=1 TO 8: READ p$
  20 FOR f=0 TO 7
  30 READ a: POKE USR p$+f,a
  40 NEXT f
  50 NEXT n
  60 DATA "A",BIN 00111100,BIN 00111100,BIN 00111100,BI
N 00011000,BIN 01111110,B
IN 01011010,BIN 01011010,BIN 01011010
  61 DATA "D",BIN 00111100,BIN 1111110,BIN 01111110,BIN
 00111100,BIN 00011000,BI
N 00011000,BIN 00011000,BIN 0
  62 DATA "F",BIN 01011010,BIN 00100100,BIN 00100100,BI
N 00101101,BIN 00110110,B
IN 00100100,BIN 01001000,BIN 10010000
  63 DATA "E",BIN 01000000,BIN 01000000,BIN 11111111,BI
N 01000000,BIN 11111111,B
IN 01000000,BIN 11111111,BIN 01000000
  64 DATA "G",BIN 01011010,BIN 00011000,BIN 00100100,BI
N 01000010,BIN 10000001,B
IN 0,BIN 0,BIN 0
  65 DATA "B",BIN 10000000,BIN 11000000,BIN 11100000,BI
N 11000000,BIN 10000000,B
IN 10000000,BIN 10000000,BIN 10000000
  66 DATA "C",BIN 0,BIN 00111100,BIN 01111110,BIN 11111
111,BIN 11111111,BIN 0111
1110,BIN 00111100,BIN 0
  67 DATA "J",BIN 0,BIN 11111111,BIN 00000000,BIN 00000
000,BIN 11111111,BIN 1111
1111,BIN 0,BIN 0
  70 DATA "B",BIN 00000110,BIN 00011110,BIN 00011110,BI
N 00000110,BIN 00000010,B
IN 00000010,BIN 00000010,BIN 0
  80 BORDER 5: PAPER 7: CLS
  90 LET j=0
 100 LET g=10
 120 DATA "C",BIN 0,BIN 0,BIN 01111110,BIN 11111111,BIN
 11101111,BIN 01111110,BI
N 0,BIN 0
 140 INK 5: PRINT AT 0,0;"****************************
****              SLALOM
          **  B      B                    **   B     B
                      **    B
    B       D               **     B      B
  **FFFFBFFFFFBFFFFFFFFF
FFFFFFFF**      B      B                   **       B A
B                      **
 B E    B       D  DD       **         B      B
  **           B A    B
D          **          BG     B             D  **          B C
   B         D        *******
**************************"
 160 BEEP 1/2,10: PAUSE 200: CLS
 170 PRINT AT 4,2;"You have a speed control so     ente
r speed (1 TO 5)": INPUT
"Speed";a:
 180 IF a>5 THEN  GO TO 170
 181 IF a<1 THEN  GO TO 170
 185 BEEP 1/2,10: PAUSE 10: CLS
 186 PRINT AT 10,5;"Press"; INK 2;"
       0 for right    "; I
NK 3;"                    1 for left  "; INK 1;"
          9  TO  jump th
e barrel ": BEEP 1/20,29
 187 PAUSE 0: CLS
 190 LET zoom=0
 200 LET ac=14
 210 LET p1=10
 215 REM                                        game*sta
rt
 220 IF p1=0 THEN  LET p1=1: IF p1>21 THEN  LET p1=p1-1
 230 INK 1: PRINT AT zoom-1,ac;" A "
 231 INK 1: IF INKEY$<>"9" THEN  PRINT AT zoom,ac;" E "
:
 240 PRINT AT zoom-2,ac-1;"    "
 250 INK 4: PRINT AT 0+zoom,p1;"B"
 260 PRINT AT 0+zoom,p1+g;"B"
 270 IF ac=1 THEN  LET ac=2
 271 IF ac=28 THEN  LET ac=27
 280 LET m1=1+INT (RND*200)
 281 PRINT AT 15,25;"D"
 282 PRINT AT 14,5;"D"
 290 IF m1<70 THEN  LET p1=p1-1
 300 IF m1>130 THEN  LET p1=p1+1
 305 IF m1>70 AND m1<130 THEN  LET p1=p1
 310 IF p1=0 THEN  LET p1=1
 311 IF p1=21 THEN  LET p1=20
 320 IF INKEY$="1" THEN  LET ac=ac-1
 330 IF INKEY$="0" THEN  LET ac=ac+1
 340 IF ac<p1 THEN  BEEP 1/2,-10: GO TO 600
 350 IF ac>p1+g THEN  BEEP 1/2,-10: GO TO 600
 360 INK 2: IF j>80 AND j<120 THEN  PRINT AT 20-zoom,ac
;"C"
 370 IF j>80 AND j<120 THEN  PRINT AT 21-zoom,ac-1;"
"
 380 IF INKEY$<>"9" AND 20-zoom=zoom AND j>80 AND j<100
 THEN  GO TO 600
 390 IF INKEY$="9" THEN  PRINT AT zoom,ac;" G ": BEEP 1
/50,30
 480 IF zoom=20 THEN  LET zoom=0: CLS
 490 LET zoom=zoom+1: LET j=j+1
 499 PAUSE a
 500 IF j>60 AND j<80 THEN  LET g=9
 510 IF j>80 AND j<100 THEN  LET g=8
 530 IF j>80 AND j<120 AND a<>1 THEN  LET a=1: BORDER 2
 540 INK 1: IF j<80 AND j>40 OR j>120 AND j<160 THEN  P
RINT AT 17,0;"FFFFFFFFFFF
FFFFFFFFFFFFFFFFFFFF"
 550 IF j<80 AND j>40 AND zoom=17 AND INKEY$<>"9" THEN
 GO TO 600
 590 GO TO 220
 600 CLS : FOR i=0 TO 5 STEP .4: BEEP 1/100,25+i: NEXT
i: PRINT AT 10,10;"your s
core=";j
 610 IF j>hi THEN  LET hi=j
 620 FOR i=0 TO 400: NEXT i: CLS :
 630 LET g=10: LET j=0: GO TO 140
```

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ZOMBIE

RUNS ON SHARP MZ-80K

Zombie Island is a great game to play and one of my personal favourites. It revolves round, believe it or not, zombies which live on a deserted island. Unfortunately, your ship lands on it by mistake and without realising just how dangerous these creatures really are. Your only couse of action is to retaliate in the most final of ways — kill them.

Although it's not a particularly fast version of this game it is nevertheless addictive to play. Zombie Island is a one player game with the object being to lure the zombies into potholes then quickly cover them over before they are within reach to kill you. A quick dice with death to speed up your adrenalin flow for a few minutes!

RUNdown

Lines	Action
5- 11	Introduction
12- 15	Start initialisation
16- 27	Instructions
28- 49	Initialisation now complete
50- 59	Set screen, potholes, zombies and man
60- 69	Movement routine
70- 79	Find out whether or not a zombie has eaten you outright or if you have jumped into a pothole.
80- 98	Find out whether a zombie has fallen into a pothole or whether it has eaten you up for a tasty breakfast.



ISLAND

By Adrian Theobald

Failing that it checks to find out whether or not any zombies are near to you.

99-116 Victory routine and another game option. Note: If another game is not required the program clears itself and you are left with your original Sharp Basic. (Lines 114-116).

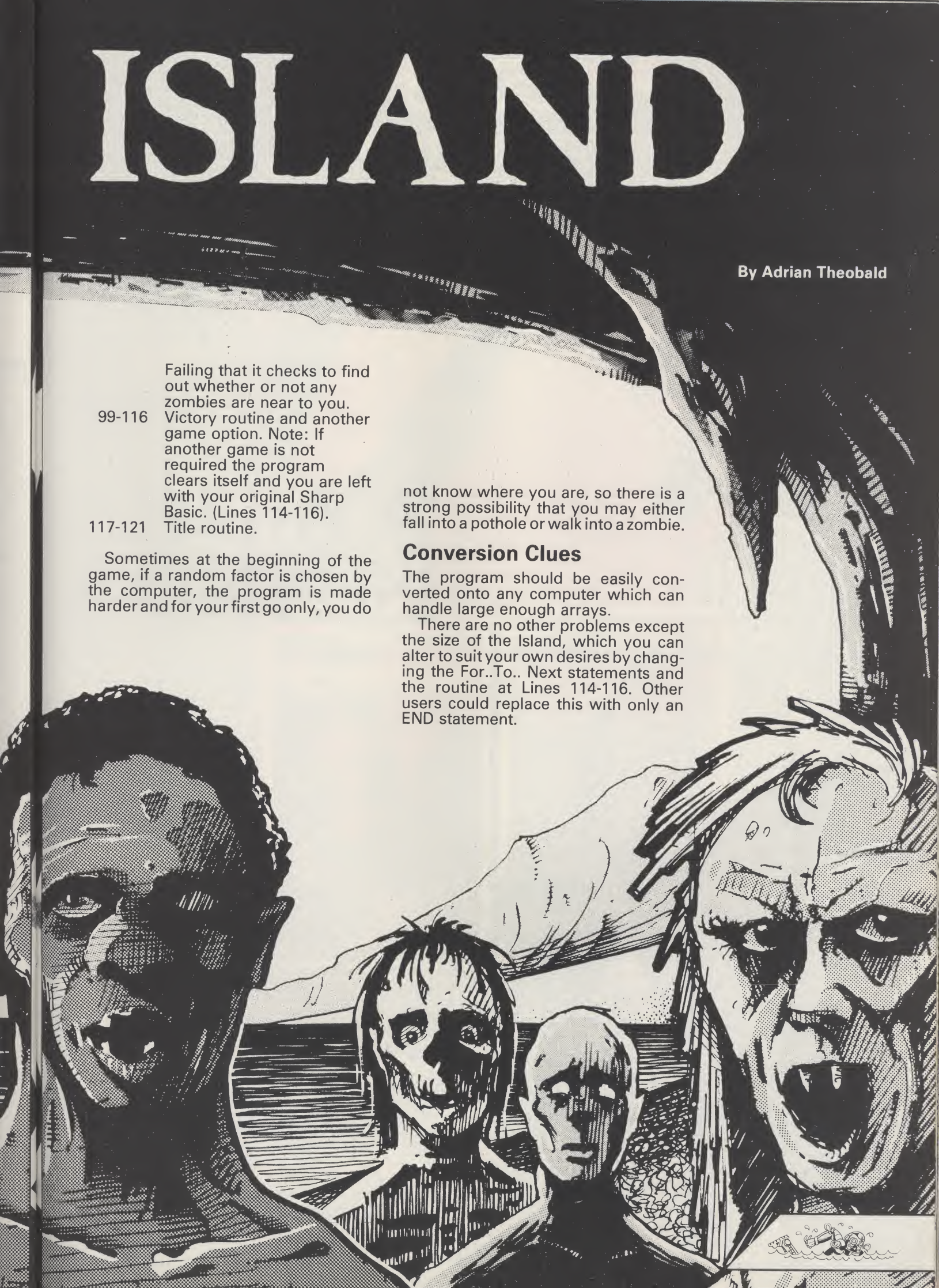
117-121 Title routine.

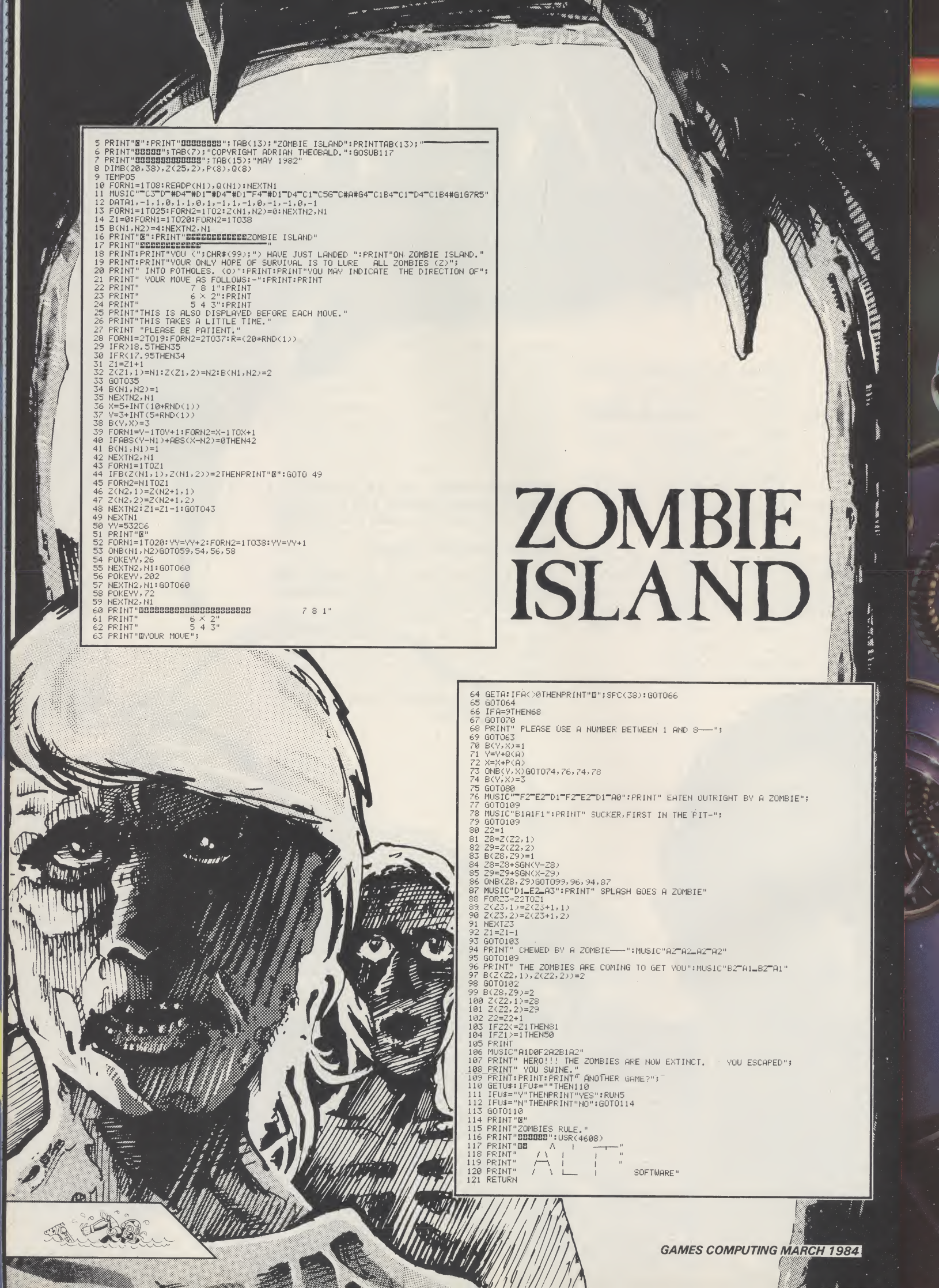
Sometimes at the beginning of the game, if a random factor is chosen by the computer, the program is made harder and for your first go only, you do not know where you are, so there is a strong possibility that you may either fall into a pothole or walk into a zombie.

Conversion Clues

The program should be easily converted onto any computer which can handle large enough arrays.

There are no other problems except the size of the Island, which you can alter to suit your own desires by changing the For..To.. Next statements and the routine at Lines 114-116. Other users could replace this with only an END statement.





ZOMBIE ISLAND

```
 5 PRINT"■":PRINT"■■■■■■■■";TAB(13);"ZOMBIE ISLAND":PRINTTAB(13);"▔▔▔▔▔▔▔▔▔▔▔▔"
 6 PRINT"■■■■■■";TAB(7);"COPYRIGHT ADRIAN THEOBALD.":GOSUB117
 7 PRINT"■■■■■■■■■■■■■■";TAB(15);"MAY 1982"
 8 DIMB(20,38),Z(25,2),P(8),Q(8)
 9 TEMPO5
10 FORN1=1TO8:READP(N1),Q(N1):NEXTN1
11 MUSIC"▔C3▔D▔#D4▔#D1▔#D4▔#D1▔F4▔#D1▔D4▔C1▔C5G▔C#A#G4▔C1B4▔C1▔D4▔C1B4#G1G7R5"
12 DATA1,-1,1,0,1,1,0,1,-1,1,-1,0,-1,-1,0,-1
13 FORN1=1TO25:FORN2=1TO2:Z(N1,N2)=0:NEXTN2,N1
14 Z1=0:FORN1=1TO20:FORN2=1TO38
15 B(N1,N2)=4:NEXTN2,N1
16 PRINT"■":PRINT"■■■■■■■■■■■■■ZOMBIE ISLAND"
17 PRINT"■■■■■■■■■■■■■▔▔▔▔▔▔▔▔▔▔▔▔▔▔▔▔"
18 PRINT:PRINT"YOU (";CHR$(99);") HAVE JUST LANDED ":PRINT"ON ZOMBIE ISLAND."
19 PRINT:PRINT"YOUR ONLY HOPE OF SURVIVAL IS TO LURE   ALL ZOMBIES (Z)";
20 PRINT" INTO POTHOLES. (o)":PRINT:PRINT"YOU MAY INDICATE  THE DIRECTION OF";
21 PRINT" YOUR MOVE AS FOLLOWS:-":PRINT:PRINT
22 PRINT"           7 8 1":PRINT
23 PRINT"           6 X 2":PRINT
24 PRINT"           5 4 3":PRINT
25 PRINT"THIS IS ALSO DISPLAYED BEFORE EACH MOVE."
26 PRINT"THIS TAKES A LITTLE TIME."
27 PRINT "PLEASE BE PATIENT."
28 FORN1=2TO19:FORN2=2TO37:R=(20*RND(1))
29 IFR>18.5THEN35
30 IFR<17.95THEN34
31 Z1=Z1+1
32 Z(Z1,1)=N1:Z(Z1,2)=N2:B(N1,N2)=2
33 GOTO35
34 B(N1,N2)=1
35 NEXTN2,N1
36 X=5+INT(10*RND(1))
37 Y=3+INT(5*RND(1))
38 B(Y,X)=3
39 FORN1=Y-1TOY+1:FORN2=X-1TOX+1
40 IFABS(Y-N1)+ABS(X-N2)=0THEN42
41 B(N1,N1)=1
42 NEXTN2,N1
43 FORN1=1TOZ1
44 IFB(Z(N1,1),Z(N1,2))=2THENPRINT"■":GOTO 49
45 FORN2=N1TOZ1
46 Z(N2,1)=Z(N2+1,1)
47 Z(N2,2)=Z(N2+1,2)
48 NEXTN2:Z1=Z1-1:GOTO43
49 NEXTN1
50 VV=53206
51 PRINT"■"
52 FORN1=1TO20:VV=VV+2:FORN2=1TO38:VV=VV+1
53 ONB(N1,N2)GOTO59,54,56,58
54 POKEVV,26
55 NEXTN2,N1:GOTO60
56 POKEVV,202
57 NEXTN2,N1:GOTO60
58 POKEVV,72
59 NEXTN2,N1
60 PRINT"■■■■■■■■■■■■■■■■■■■■■■■■          7 8 1"
61 PRINT"           6 X 2"
62 PRINT"           5 4 3"
63 PRINT"■YOUR MOVE";
```

```
64 GETA:IFA<>0THENPRINT"■";SPC(38):GOTO66
65 GOTO64
66 IFA=9THEN68
67 GOTO70
68 PRINT" PLEASE USE A NUMBER BETWEEN 1 AND 8▔▔";
69 GOTO63
70 B(Y,X)=1
71 Y=Y+Q(A)
72 X=X+P(A)
73 ONB(Y,X)GOTO74,76,74,78
74 B(Y,X)=3
75 GOTO80
76 MUSIC"▔FZ▔EZ▔D1▔FZ▔EZ▔D1▔A0":PRINT" EATEN OUTRIGHT BY A ZOMBIE";
77 GOTO109
78 MUSIC"B1A1F1":PRINT" SUCKER,FIRST IN THE PIT-";
79 GOTO109
80 Z2=1
81 Z8=Z(Z2,1)
82 Z9=Z(Z2,2)
83 B(Z8,Z9)=1
84 Z8=Z8+SGN(Y-Z8)
85 Z9=Z9+SGN(X-Z9)
86 ONB(Z8,Z9)GOTO99,96,94,87
87 MUSIC"D1_E2_A3":PRINT" SPLASH GOES A ZOMBIE"
88 FORZ3=Z2TOZ1
89 Z(Z3,1)=Z(Z3+1,1)
90 Z(Z3,2)=Z(Z3+1,2)
91 NEXTZ3
92 Z1=Z1-1
93 GOTO103
94 PRINT" CHEWED BY A ZOMBIE▔▔":MUSIC"A2▔A2_A2▔A2"
95 GOTO109
96 PRINT" THE ZOMBIES ARE COMING TO GET YOU":MUSIC"B2▔A1_B2▔A1"
97 B(Z(Z2,1),Z(Z2,2))=2
98 GOTO102
99 B(Z8,Z9)=2
100 Z(Z2,1)=Z8
101 Z(Z2,2)=Z9
102 Z2=Z2+1
103 IFZ2<=Z1THEN81
104 IFZ1>=1THEN50
105 PRINT
106 MUSIC"A1D0F2A2B1A2"
107 PRINT" HERO!!! THE ZOMBIES ARE NOW EXTINCT.   YOU ESCAPED";
108 PRINT" YOU SWINE."
109 PRINT:PRINT:PRINT" ANOTHER GAME?";
110 GETU$:IFU$=""THEN110
111 IFU$="Y"THENPRINT"YES":RUN5
112 IFU$="N"THENPRINT"NO":GOTO114
113 GOTO110
114 PRINT"■"
115 PRINT"ZOMBIES RULE."
116 PRINT"■■■■■■■":USR(4608)
117 PRINT"■■     /\   |    ▔▔▔▔▔"
118 PRINT"    / \   |      |    "
119 PRINT"   /▔▔\  |      |    "
120 PRINT"  /   \ |__    |       SOFTWARE"
121 RETURN
```

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FOX & HOUNDS

The fox isn't the only one in this game of strategy who has to be cunning, you'll soon find out that you have to be too!

Fox and Hounds is played out on a chess board grid which is shown on the screen of your Sharp MZ 80K. The sole object of the game is to trap the fox, whose role is played by the computer, by your pack of hounds which is naturally controlled by you, the player.

All the pieces on the board move as in the traditional game of draughts and just in case any of you are unfamiliar with that game it means you can move diagonally one square at a time. The fox is located at the top of the board and the pack of hounds at the bottom of the board. Be careful though because the cunning fox can move both backwards and forwards but the hounds can only move forwards.

To win the game you must make your hounds surround the fox so that it cannot move, or you can trap it by chasing it into a corner or against the side of the board.

Moving About

After the board has been constructed on the screen you must wait for the cursor to appear in the top right hand corner. At this point the program is waiting for you to input a set of co-ordinates that relate to the piece that you move.

This input string is expecting a four character code, with the first two characters being the current square reference. Once you have entered your move, ‹CR› must be pressed to register it with the computer.

The computer checks all entered moves for validity and if the move requested is illegal the input string is deleted and you must try again. All the moves are indexed from the bottom left hand corner, this being 11, and the co-ordinates can thus be taken along and upwards.

The program itself plays a very defensive game, but it is possible to beat it with a bit of determination and a few skilful strategic moves.





If you wish to move your hound the move you would enter is 1122, moving it to the position of the asterisk sign.

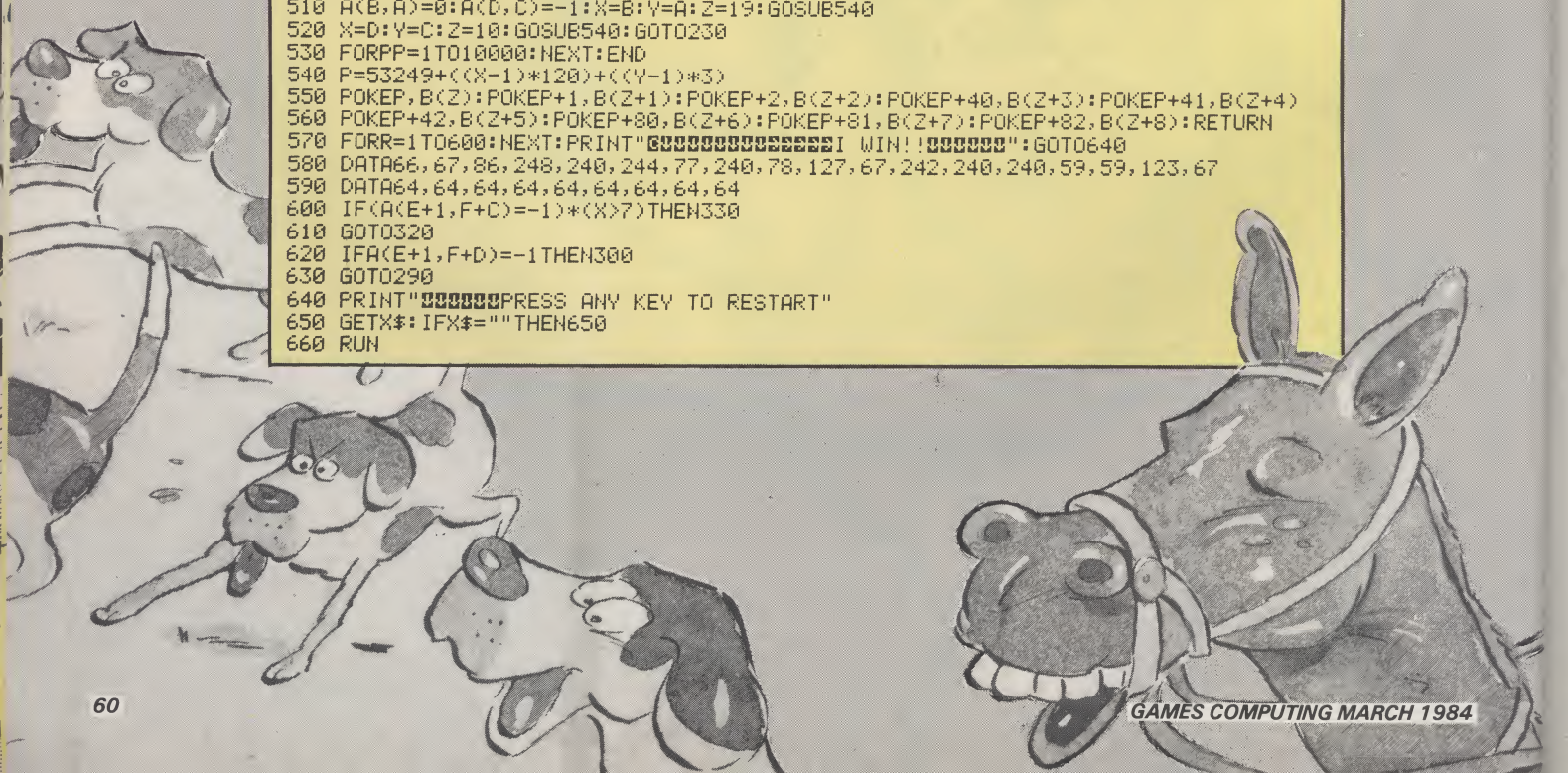
If, for instance, the fox moved to the position marked ?, the format would be 3746.

Conversion Clues

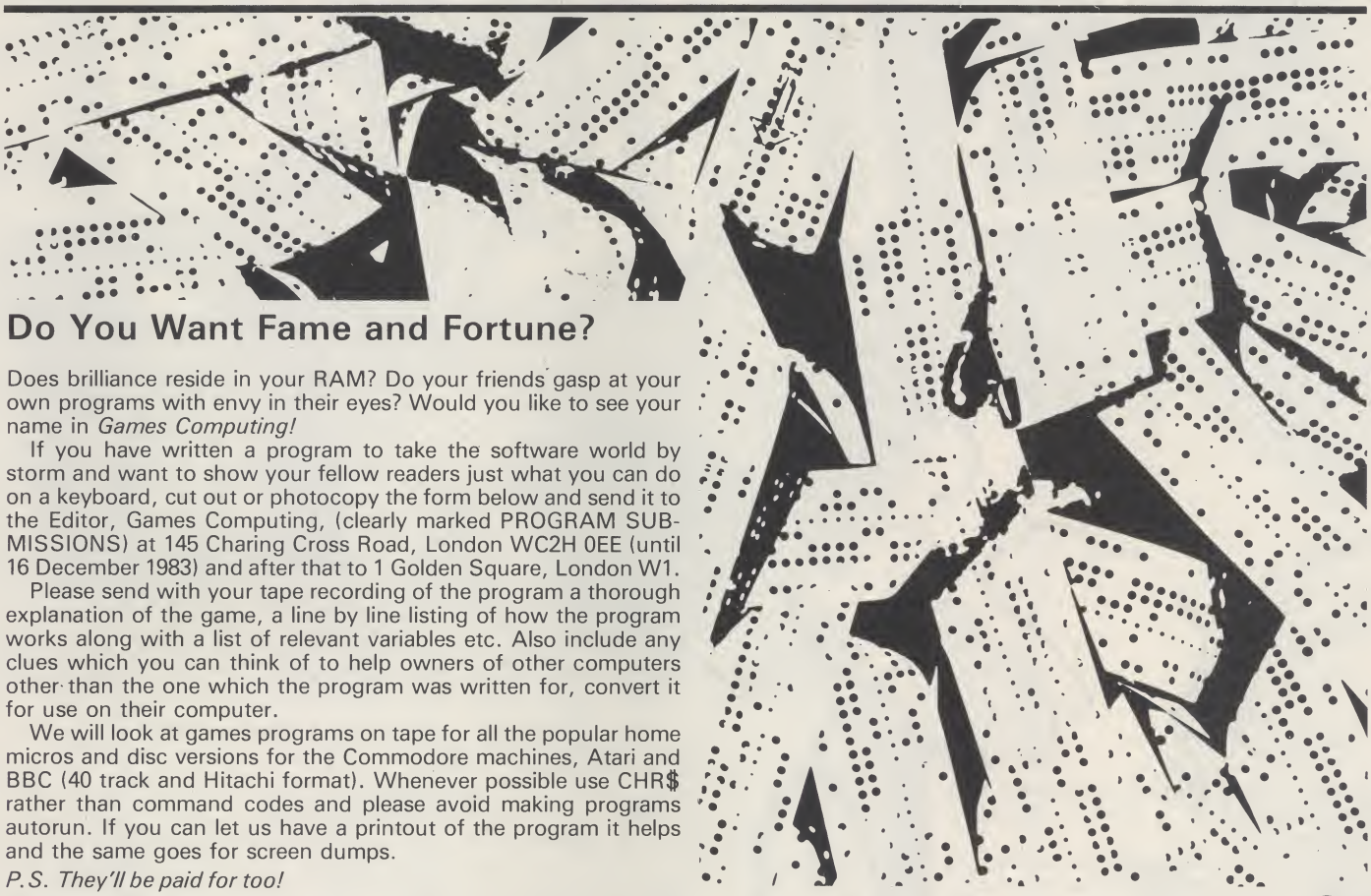
Fox and Hounds should be convertible to most other home micros without too much trouble, the main difficulty being the screen format which you will have to work out according to your own computer's screen size. The Sharp's screen is 40 X 25 which is the same as the Commodore PET.



```
10 REM ***FOX AND HOUNDS CONVERTED BY***
20 REM ***ADRIAN THEOBALD FROM A PROG***
30 REM ***IN CT-OCT 1980 FOR A PET***
40 REM ***ORIGINALLY WRITTEN BY***
50 REM ******PAUL  WILLIAMS******
60 PRINT"■■■■■■■■■■■■■■■■■■■■■■■■■■■■FOX AND HOUNDS■":FORX=1TO1500:NEXT
70 PRINT"■■■■■■■■■■■■■■■■■■■■■■■■HOW MANY HOUNDS■"
80 INPUT"■■■■■(2 TO 4;TYPE 1 FOR RANDOM)   ";A$
90 Q=VAL(A$):IF(Q<1)+(Q>4)+(Q<>INT(Q))THEN80
100 IFQ=1THENQ=INT(RND(TI)*3)+2
110 Q=Q*2-1
120 A$="▒▒▒":B$="   ":C$="■■■■■■■■■":DIMA(10,10),B(27):PRINT"■"
130 FORA=1TO4:FORB=1TO3:PRINT" ▌";A$;B$;A$;B$;A$;B$;A$;B$;"▌ ":NEXT
140 FORB=1TO3:PRINT" ▌";B$;A$;B$;A$;B$;A$;B$;A$;"▌ ":NEXT:NEXT
150 FORA=54209TO54232:POKEA,54:NEXT
160 FORA=1TO27:READB(A):NEXT
170 PRINT"■■";TAB(30);"FOX AND":PRINTTAB(30);"━━━━━━":PRINTTAB(30);"HOUNDS."
180 PRINTTAB(30);"━━━━━━":PRINTTAB(28);"■YOUR MOVE:■"
190 PRINTTAB(28);"?■"
200 FORA=1TO8:FORB=1TO8:IF(A+B)/2=INT((A+B)/2)THENA(A,B)=9
210 NEXT:NEXT:FORA=1TOQSTEP2:A(8,A)=-1:NEXT:A(1,4)=1
220 X=1:Y=4:Z=1:GOSUB540:X=8:FORY=1TOQSTEP2:Z=10:GOSUB540:NEXT
230 FORX=1TO8:FORY=1TO8:IFA(X,Y)<>1THENNEXT:NEXT
240 C=(INT(RND(TI)*2)*2)-1:D=-C
250 E=X+1:F=Y+C:GOSUB400:IFG=1THEN300
260 IF((A(X,F+C)=-1)+(F+C<1)+(F+C>8))*(A(E+1,F+C)=-1)+(F+C<1)+(F+C>8)THEN280
270 GOTO290
280 IFX<7THEN620
290 IFA(E,F)=0THEN430
300 E=X+1:F=Y+D:GOSUB400:IFG=1THEN330
310 IF((A(X,F+D)=-1)+(F+D<1)+(F+D>8))*((A(E+1,F+D)=-1)+(F+D<1)+(F+D>8))THEN600
320 IFA(E,F)=0THEN430
330 E=X-1:F=Y+C:GOSUB400:IFG=1THEN350
340 IFA(E,F)=0THEN430
350 E=X-1:F=Y+D:GOSUB400:IFG=1THEN370
360 IFA(E,F)=0THEN430
370 IF(A(X+1,Y+D)=0)*(X<8)*(Y+D>0)*(Y+D<9)THENE=X+1:F=Y+D:GOTO430
380 IF(A(X+1,Y+C)=0)*(X<8)*(Y+C>0)*(Y+C<9)THENE=X+1:F=Y+D:GOTO430
390 PRINT"■■■■■■■■■■■■■■■■■■■■YOU WIN!!■■■■■■■":GOTO640
400 G=1
410 IF(E>0)*(E<9)*(F>0)*(F<9)THENG=0
420 RETURN
430 A(E,F)=1:A(X,Y)=0:Z=19:GOSUB540:X=E:Y=F:Z=1:GOSUB540
440 IF(A(8,1)=1)+(A(8,3)=1)+(A(8,5)=1)+(A(8,7)=1)THEN570
450 PRINTC$;TAB(28);:INPUT" ";X$:IFX$="STOP"THENPRINT"■■■■■■■":END
460 IFLEN(X$)<>4THEN450
470 A=VAL(LEFT$(X$,1)):B=9-VAL(MID$(X$,2,1))
480 C=VAL(MID$(X$,3,1)):D=9-VAL(RIGHT$(X$,1))
490 IF(A<1)+(A>8)+(B<1)+(B>8)+(C<1)+(C>8)+(D<1)+(D>8)THEN450
500 IF(A(B,A)<>-1)+(A(D,C)<>0)+(B-D<>1)+(ABS(A-C)<>1)THEN450
510 A(B,A)=0:A(D,C)=-1:X=B:Y=A:Z=19:GOSUB540
520 X=D:Y=C:Z=10:GOSUB540:GOTO230
530 FORPP=1TO10000:NEXT:END
540 P=53249+((X-1)*120)+((Y-1)*3)
550 POKEP,B(Z):POKEP+1,B(Z+1):POKEP+2,B(Z+2):POKEP+40,B(Z+3):POKEP+41,B(Z+4)
560 POKEP+42,B(Z+5):POKEP+80,B(Z+6):POKEP+81,B(Z+7):POKEP+82,B(Z+8):RETURN
570 FORR=1TO600:NEXT:PRINT"■■■■■■■■■■■■■■I WIN!!■■■■■■■":GOTO640
580 DATA66,67,86,248,240,244,77,240,78,127,67,242,240,240,59,59,123,67
590 DATA64,64,64,64,64,64,64,64,64
600 IF(A(E+1,F+C)=-1)*(X>7)THEN330
610 GOTO320
620 IFA(E+1,F+D)=-1THEN300
630 GOTO290
640 PRINT"■■■■■■■PRESS ANY KEY TO RESTART"
650 GETX$:IFX$=""THEN650
660 RUN
```



PROGRAM SUBMISSIONS



Do You Want Fame and Fortune?

Does brilliance reside in your RAM? Do your friends gasp at your own programs with envy in their eyes? Would you like to see your name in *Games Computing!*

If you have written a program to take the software world by storm and want to show your fellow readers just what you can do on a keyboard, cut out or photocopy the form below and send it to the Editor, Games Computing, (clearly marked PROGRAM SUBMISSIONS) at 145 Charing Cross Road, London WC2H 0EE (until 16 December 1983) and after that to 1 Golden Square, London W1.

Please send with your tape recording of the program a thorough explanation of the game, a line by line listing of how the program works along with a list of relevant variables etc. Also include any clues which you can think of to help owners of other computers other than the one which the program was written for, convert it for use on their computer.

We will look at games programs on tape for all the popular home micros and disc versions for the Commodore machines, Atari and BBC (40 track and Hitachi format). Whenever possible use CHR$ rather than command codes and please avoid making programs autorun. If you can let us have a printout of the program it helps and the same goes for screen dumps.

P.S. They'll be paid for too!

★ PLEASE COMPLETE IN BLOCK CAPITALS

Your Name Age

Program Name

Computer/memory size it runs on

Amount of memory program occupies

Other computers/memory size which your program runs on

Does your game need joysticks? Yes No

Any known bugs? If so, what are they?

Have you sent your game to another magazine Yes No

Is it original/or a variation on a theme?

Your Address

Telephone Number

Times to contact you



COMPETITION 1
COMPETITION 2



Ten packs of Carnell Software's best programs are up for grabs in our latest competition.

Let your creative talents run riot, try your hand at poetry, or become a new poet laureat, by entering our great limmerick competition.

If you are one of the ten lucky winners you will receive a pack of four programs from Carnell Software for the ZX Spectrum, these being two arcade games and two adventure games. The two adventure games are The Black Crystal and Volcanic Dungeon. These two are the first two adventures in the Third Continent series and follow on from each other. The third episode in the series is tobe released at the end of February and is called The Wrath of Magra.

The adventures are set in the mythological land of the Third Continent, and involves trying to do away with a baddy called Magra. The two adventures that we are giving away happen at about the same time but The Wrath of Magra is cronologicly afterward. So after you've had your fill of the games we are giving out you can buy the sequel to finish off the series.

The two arcade games are called The Adventures of St Bernard and The Devil Rides In. The Adventures of St Bernard involves a dog traversing hazardous terrain to rescue his mistress from an abominable snowman. This game is said to feature the best graphics you can possibly get on the Spectrum.

The Devil Rides In is a supernatural arcade game in which you are a wizard trying to dispose of various ghosts, ghouls, and demons with your magic talisman. Stuart Galloway of Carnel described it as "a kind of 360 degree Galaxians" and "nobody has got past level two yet!"

Carnell are a leading software house specialising in the production of adventure software for the 48K ZX Spectrum, and have been established for two years.

To Win

All you have to do is to make up a suitable and witty limerick.

The limerick should be preferably funny, apt, either to be based on one of the adventures or the arcade games.

Competition Rules

1. This competition is open to all UK and Northern Ireland readers of *Games Computing,* except employees of Argus Specialist Publications Ltd, their printers or distributors, employees of Rabbit Software Ltd, or anyone connected with them.
2. All entries must be postmarked before 31 March 1984.
3. The prizes will be awarded to the ten entries judged to be worthy of merit by the editor.
4. No correspondence will be entered into with regard to the competition results and it is a condition of entry that the judges decision is final.
5. The winners will be notified by post and the results will be published in a future edition of *Games Computing.*

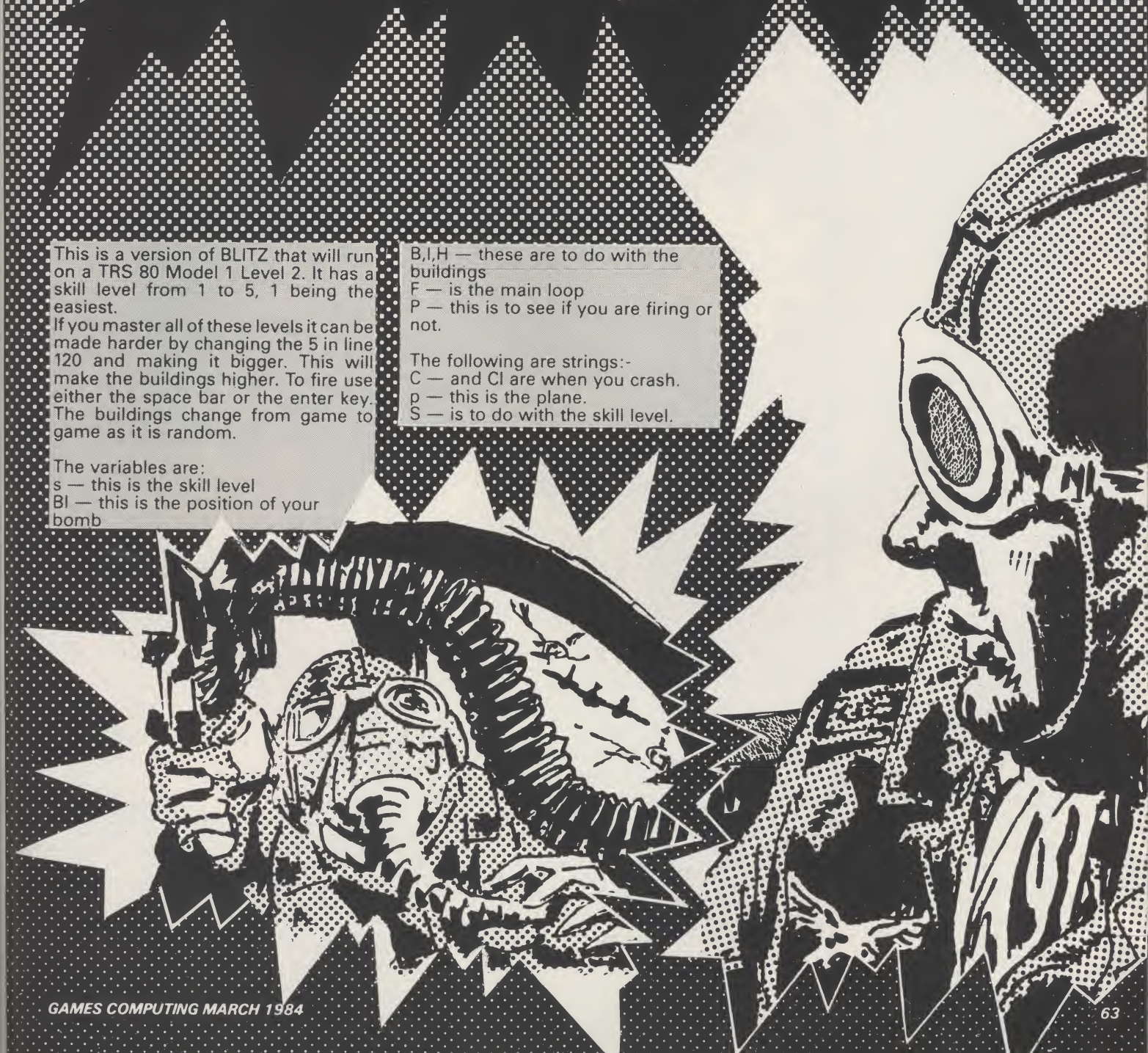
BLITZ

RUNS ON TRS-80

This is a version of BLITZ that will run on a TRS 80 Model 1 Level 2. It has a skill level from 1 to 5, 1 being the easiest.
If you master all of these levels it can be made harder by changing the 5 in line 120 and making it bigger. This will make the buildings higher. To fire use either the space bar or the enter key. The buildings change from game to game as it is random.

The variables are:
s — this is the skill level
BI — this is the position of your bomb
B,I,H — these are to do with the buildings
F — is the main loop
P — this is to see if you are firing or not.

The following are strings:-
C — and CI are when you crash.
p — this is the plane.
S — is to do with the skill level.



BLITZ

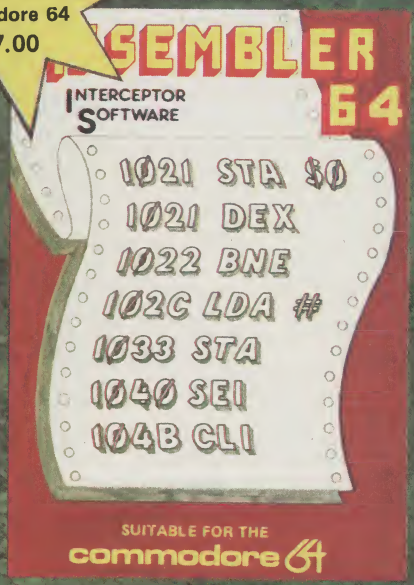


```
0 CLS
5 GOTO3000
50 CLS
55 PRINT"INPUT YOUR SKILL LEVEL? 1-5":S$=INKEY$
56 S$=INKEY$:IFS$=""THEN56
57 S=VAL(S$):IFS>5THEN55
58 IFS<1THEN55
60 Z=0:B1=0
90 C$=STRING$(6,191):C1$=STRING$(6,128)
99 CLS
100 P$=CHR$(141)+CHR$(140)+CHR$(140)+"=="+CHR$(140)
110 FORI=15360+896TO15360+956STEP7-S
120 B=INT(RND(0)*5)
130 FORH=ITOI-(B*64)STEP-64
140 POKEH,183
150 POKEH+1,187
160 NEXTH
170 NEXTI
200 FORF=0TO1023
210 PRINT@F,P$;:PRINT@B1,CHR$(92);
220 IFF=1000,1000
230 IFPEEK(F+15366)=183,2000
240 IFPEEK(F+15366)=187,2000
250 P=PEEK(14400)
255 IFP=0THENZ=0ELSEZ=1
260 IFB1>F+60THENZ=1
270 IFB1>=958THENPRINT@B1," ";:Z=0
290 IFZ=1THENPRINT@B1," ";:B1=B1+64
300 IFZ=0THENB1=F+2
390 PRINT@F,"     ";
400 NEXTF
1000 FORI=1TO300:NEXTI:CLS:PRINT"WELL DONE YOU HAVE LANDED!!  'TRY AGUSRIN'":FOR
I=1TO500:NEXTI:GOTO50
2000 FORI=1TO5:PRINT@F-64,C1$;:PRINT@F,C1$;:PRINT@F+64,C1$;:FORX=1TO100:NEXTX:PR
INT@F-64,C$;:PRINT@F,C$;:PRINT@F+64,C$;:FORK=1TO100:NEXTK:NEXTI
2010 GOTO50
3000 PRINT"DO YOU NEED INSTRUCTIONS"
3005 A$=INKEY$:IFA$=""THEN3005
3010 IFLEFT$(A$,1)="Y"THEN3020ELSEGOTO50
3020 CLS:PRINT@270,"P L A Y  B L I T Z ! ! !"
3025 PRINT:PRINT
3030 PRINT"YOUR PLANE HAS BEEN HIT AND YOUV ONLY CHANCE IS FOR YOU TO LAND!"
3040 PRINT"THE PROBLEM IS THAT YOU DO NOT HAVE ENOUGH FUEL TO REACH SAFETY"
3050 PRINT"SO, AS YOU HAVE SO MANY BOMBS ON BOARD YOU TRY TO FLATEN A "
3060 PRINT"LANDING STRIP IN THE CITY!!"
3070 PRINT"IT IS A RACE AGAINST TIME BECAUSE YOU ARE LOSEING HEIGHT RAPIDLY"
3080 GOTO55
```

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ARCADE







Simon Rockman is a demon for real arcade games so we sent him out to investigate the very latest in laser disc games. Here's what he saw.

In the good old bad old days, when computers were only found in schools, universities and banks, there lived a man called Nolan Bushnel who realised that if you could charge people to play games on a computer you would make a fortune.

Unfortunately computers were so expensive that the fortune you could make was not big enough to pay for the computer that you would need! Then came the mass production of the silicon chip. The price of computers fell like leaves in August and Bushnel could afford to build his own video machine. He made a "ball" bounce between two "bats" and he called his game "PONG". So successful was this venture that he set up a company to make the machines. He called the company "ATARI" after the attacking move (a threat to take like check in chess) in the board game GO. PONG was just the start, it was followed by "Breakout",

ACTION

"Super Breakout", and many more. Soon arcades started to fill with video machines. Then a few years later a firm called TAITO in Japan invented "Space Invaders" and no pub, record shop or take-away kebab restaurant lacked the bleeps and buzzing of these machines.

In The Early Days

The home computer did not really exist. The ZX80 was in its infancy, a few people had TRS80's, Apples and Commodore PET's with calculator keyboards, and you could count the number of computer magazines on one hand. But it wasn't long before home computers started to take off — and the arcades got smart too. We started to see colour in "Moon Cresta" and "Space Panic". The tank game "Battlezone" produced some very clever graphics using Vector plot. This uses a technique which allow the computer to control the electron beam in the video display rather than build the picture up like a normal TV picture. But this was nothing in comparison to the growth that home computers experienced. To start with the gap was huge. Arcade machines use dedicated chips, custom hardware and take many, many man hours to design. Home computers need to be cheap and versatile. Who is going to pay £2000 just to play one game? Arcade games always seemed one step ahead of computer games. The closest anyone came was ATARI which Bushnell eventually sold. In 1981 came the BBC Computer made by Acorn. When it was launched this machine was so much faster and had such good graphics that it proved to be the best, if rather expensive, way to bring arcade hits to the home. Acornsoft wrote and released "Defender" (later renamed to "Planetoid"), "Snapper" (a "Pac Man" varient) and "Monsters" (similar to "Space Panic"). The home computer had caught up.

At the same time the popularity of the arcades had started to wain. All the big companies withdrew and regrouped, pouring thousands upon thousands of dollars into research and development. Three major things came out of this. Firstly the use of 16 bit chips — very handy for moving large quanitities of data on the screen at the same time for games like the racing car game "Pole Position". Secondly, multiprocessor boards — Galaga has four Z80's in it, and thirdly laser discs. The result is games you no longer just play, you *experience* them, for instance at the end of the race in "Pole Position" or after you've blown up the Death Star in "Star Wars" you feel that you have actually driven a car or flown a spaceship yourself. Arcade machines are now so far ahead in the field that if they stopped development projects today it would be years before home computers would catch up. The use of laser discs may mean that they never will.

Laser Discs — Latest Generation

The first laser disc game to reach the UK was "Astron Belt". This uses footage from an unreleased Japanese film showing spaceships flying towards you at high speed. The computer part of the machine generates a small space ship which you fly. Because the computer does not have to worry about generating the shapes on the screen it just defines areas. These can be either targets or hostile areas. So if you shoot an enemy ship it explodes and if you run into an enemy missile you blow up. It also defines the areas, such as the walls of a tunnel, which are dangerous, so if you hit them it's bye-bye!

The laser disc does have some restrictions. Because it is read you can only vary the game by changing discs which means the randomness is restricted. Another problem is that unlike a computer generated display you can't change or delete an item from a picture. So if you shoot something it doesn't go crashing to the ground leaving other ships to fly on, instead you get a huge fireball which envelopes the whole screen. Otherwise the disc would need to hold frames for every possible combination of one, two, or all three ships missing from a set.

With more than three ships this would be so exhaustive on memory, even with the many megabytes a video disc allows, that it would be impractical. To play "Astron belt" the controls are very simple. One "Gorf" type joystick with a trigger on it. The sound is good but the outstanding feature is the vibrating seat! From the players point of view the worst feature is the hungry coin slot, usually set to 30 or 40p a game.

Dicing With Dragons

Another of the new disc games is "Dragons Lair". You play the part of 'Dirk Daring' and have to fight your way through a castle to rescue a princess. When the game was launched in the US there were queues in the streets to play it! The quality of the graphics is better than most TV cartoons and the sound and voice (recorded on the disc) are brilliant. The controls consist of a joystick and a sword button. It is a game of memory rather than of skill. You have to remember what is going to happen and react at the right moment. If you get the chance to watch an expert play it's better than any film you could possibly see. However, because it is so difficult and expensive to play very few people seem to get very far in the game. Another restriction is that as you go from room to room the screen blanks as the control searches for the next sequence on the disc. Perhaps with two disc players the system could make the cinema look boring.

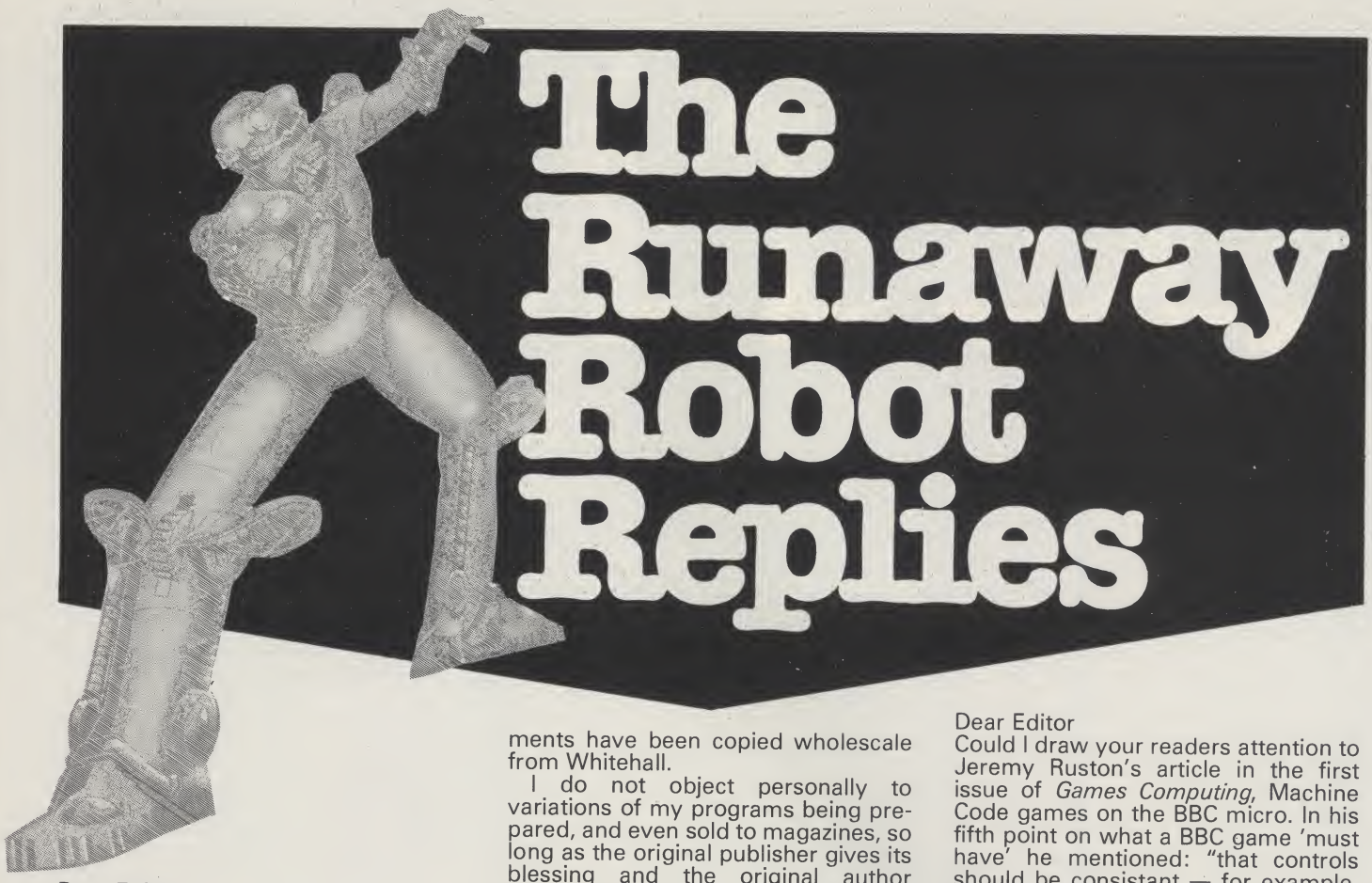
My favourite of all the laser disc games is MACH 3. In this you fly either a fighter or a bomber over a desert and a harbour. As you look out through your cockpit window you see various targets marked out in the head up display. Your task is to destroy these but you must also dodge the heat seeking missiles fired at you. This means firing as rapidly as possible. Again the voice is stored on disc but what makes this game exceptional is that the link between the computer and disc control is so good that you feel much more in control than on most other games. As you turn the 'plane banks, the targets are computer generated so the screen does not have to blank to create an explosion. I suppose that some people would claim that the disc is under used, but I like the amount of control that you have.

One game that I have not played, yet, is "Laser Grand Prix". As a fan of car racing games this looks as if it's tremendous. It doesn't involve shooting, zapping or bombing anyone, thing or body and is purely a game of skill. Back on the Mount Fuji Racetrack you have to drive in a race filmed on location and compete with cars that ran in the real race. All it lacks is the smell of exhaust and the spray of champagne. And I can't wait!

What's To Come ...

Arcade games have come a long way since PONG and as they continue to improve other benefits will arise; home computers will benefit, and simulators will get better. Imagine your first few driving lessons without having to actually go out on the road. A machine could generate fog, ice, snow and all the other hazards that are usually too dangerous to teach in. Learning to fly could become very much cheaper if a lot of practice can be done on the ground.

I would like to thank TITEL for their help with this article. They are a leading manufacturer and wholesaler of arcade games so if you run an arcade or want to buy a machine you can contact them on 01-965-0550.



The Runaway Robot Replies

Dear Editor
I went to the newsagent on Wednesday the 20th of December and saw on the counter a magazine. It was colourful and looked exciting. I picked it up and had a quick look. I thought it would cost about £2.00, I looked at the price and nearly fainted, I thought I was seeing things! The magazine was *Games Computing*.

I bought it and rushed home to read it. I sat down on a chair and started to read.

The best thing I like about it is how the magazine tells me about a game, but not just any old game for any old computer. It tells me about lots of games for different computers.

I can't wait for next month's.

Philip Lofthouse
Yorkshire

Dear Editor,
I was surprised to see that Runaway Robot was not my only contribution to the first issue of *Games Computing*. The program Westminster (pages 86-89) has been copied from my game Whitehall published in Practical Computing in May 1982. Whitehall had previously been distributed for me by The Softwarehouse. Presumably when Stephen Knight copied the program from Practical Computing he was too stupid to realise that the original author might be contributing to the same magazine.

I am angry that Stephen Knight has attempted to pass off the program as though he wrote it himself. In the process he has managed to miss-spell the words 'parliament', 'prime minister' and even 'scandal'. In each case he has attempted to copy the wording of my program, program structure, line numbers, variable names, and even comments have been copied wholescale from Whitehall.

I do not object personally to variations of my programs being prepared, and even sold to magazines, so long as the original publisher gives its blessing and the original author receives a credit. I am annoyed that Stephen Knight should receive payment for someone else's ideas and effort.

I hope this letter will serve to dissuade other would be plagiarists.

Simon Goodwin
Tewkesbury

Thank you for pointing that out to us Simon, and I am sorry to say that this case is not the only one to have arisen. Very often there are games for which many versions have been written. Stephen Knight was extremely concerned when the above matter was mentioned to him and strongly denies that the program is a direct copy of your Whitehall program. He admits that the *idea* for the game came from your original program and that the variable names are the same, but also says that ideas are not copyright.

As there are so many computer magazines now on sale we have to rely on the author to tell us whether or not his/her game has been copied from someone else's work, as it would be an almost impossible task to check every program in every issue of every magazine on sale to the public.

Dear Editor
Could I draw your readers attention to Jeremy Ruston's article in the first issue of *Games Computing*, Machine Code games on the BBC micro. In his fifth point on what a BBC game 'must have' he mentioned: "that controls should be consistant — for example, take Acornsoft's Missile Base game which requires you to press 'space' to go from the first instruction page to the second, and 'return' to go from the second page to the game itself — which shows utter idiocy".

This is more than academic, since I created Acornsoft's Missile Base. Shaken by the criticism, worried that my memory was failing, I loaded up Missile Base, and, (gee — it's just as I left it) it's only got one title page, from which pressing any key will begin the game.

Now I don't know how many commercial arcade games Mr Ruston has written, I have written five, two of which have yet to hit the shops, but I actively dislike being pompously labelled an 'utter idiot' because of such a simple, and indeed imagined, slip as choosing different keys to switch between instruction pages and the game. Perhaps the system Mr Ruston reviles so is better, for it could allow the user to hit return on the first title page and hence start the game from there.

Perhaps Mr Ruston could show more leniency in labelling programmers as 'utter idiots' because of an imaginary slight.

Andy Green
Flitwick

Have you got any opinions to air, has someone somewhere upset you and you want to grizzle and gripe? Or maybe you're full of the joys of spring and feel like telling a happy story?
Whatever you want to say, be it good, bad or indifferent drop us a line here at Games Computing and get it off your shoulders.
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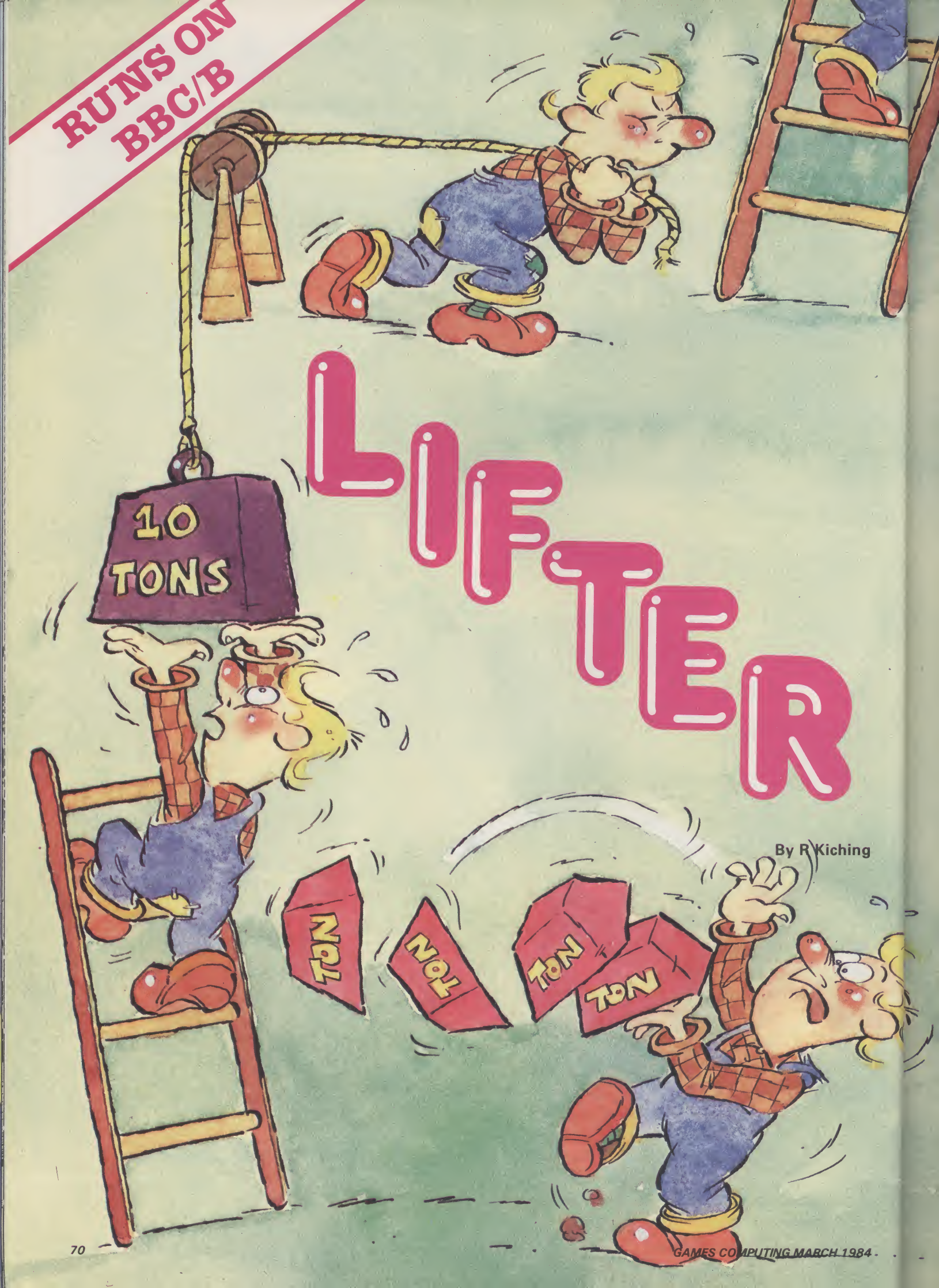
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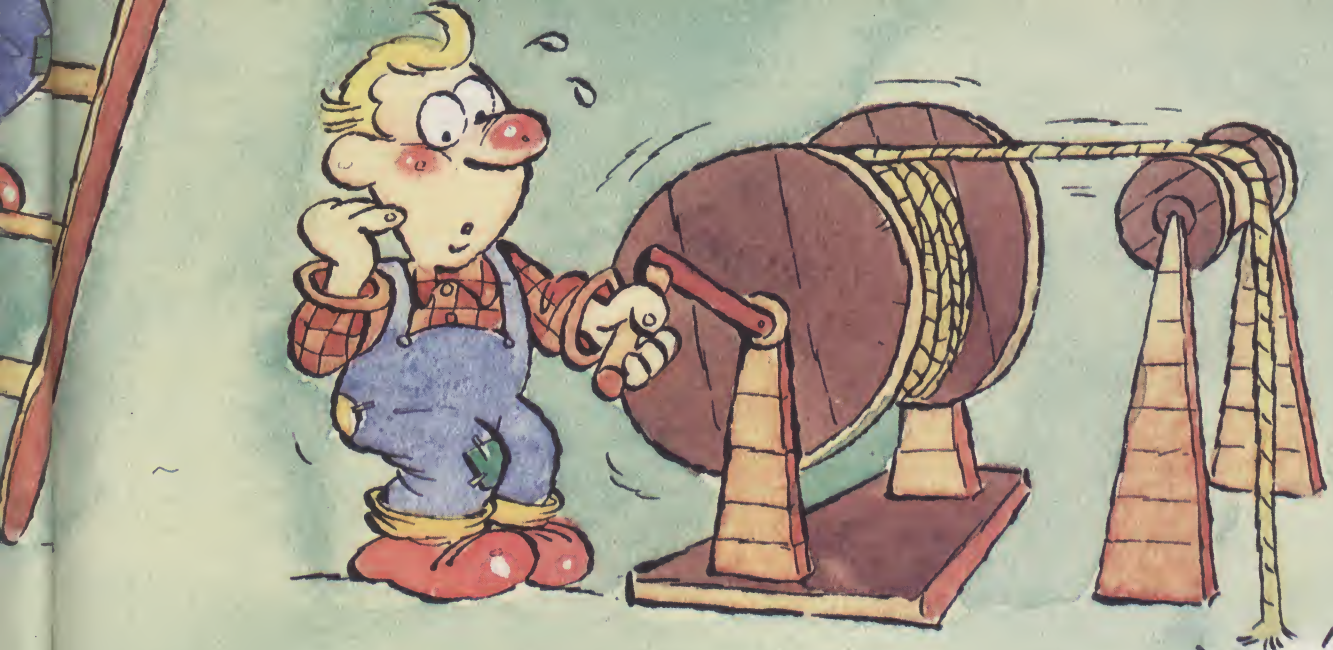
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RUNS ON BBC/B

LIFTER

By R Kiching





Lifter is a fun game to play on the BBC Micro in which you control an animated man whose job it is to lift, collect and shift pounds from one side of the screen and deliver them to the other.

On the screen you'll see four floor levels within a building with a lift passing each level making three lifts in total. You must use these to climb up from level to level. Sounds easy! But there's more to it than that

You'll find full instructions for playing the game within the program. This game is ideal for those of you who as yet do not have a wealth of programming experience as the program is written in Basic and it is fairly easy to study for structure.

Here is a list of the procedures which are used in Lifter that you will find handy to know about when typing the program in to the computer.

The following procedures are used within the program:



DEFPROCdrawup(X%,T%,O%) . line 240	draws the two outer lifts. X%,T%,O% determines whether lifts go up or down
DEFPROCLIFT..... line 380	moves centre lift up or down and checks if man is on lift
DEFPROCSETUP..... line 460	sets and draws initial conditions for screen and score
DEFPROCWALLS line 500	draws the four floors
DEFPROCUp(Z%) line 610	moves man up (+Z%) or down (−Z%) on centre lift
DEFPROCFALL..... line 650	prints man falling off lift
DEFPROCDIE line 790	checks if man is at floor level
DEFPROCPICKUP line 840	changes man character to man carrying pound and updates score
DEFPROCDROP..... line 880	changes man character to man without pound and updates score
DEFPROCMOVEL line 930	checks to see if man can move left and calls relevant procedure
DEFPROCMOVER..... line 1050	as above except for right movement
DEFPROCSCORE..... line 1170	score update routine
DEFPROCINIT..... line 1200	initialises all characters
DEFPROCTITLE line 1310	displays opening title page
DEFPROCINSTRUCT line 1420	playing instructions and game object
DEFPROCENDTUNE..... line 1490	plays final tune on loss of last life
DEFPROCMAN(M$)..... line 1560	prints man character, actual character depends on M$
DEFPROCAMB..... line 1570	draws and moves ambulance
DEFPROCSCORES line 1650	prints hi-score table
DEFPROCSPACE(F%,G%) line 1750	prints space message at F%, G%

The main loop of this program is around lines 80-220 with the actual game being between the REPEAT-UNTIL loop at lines 140-180.






```
>L.07L.
    1 REM LIFTER by R.Kitching 25/10/83
   10 ENVELOPE1,0,0,0,0,0,0,0,126,-4,0,-1,126,10:ENVELOPE2,1,2,-2,2,10,20,10,1,0
,0,-1,126,126:ENVELOPE3,2,3,-1,3,10,100,100,30,0,0,-2,126,126
   20 DIFF%=20:DIM A%(4),DR%(4),sc(8),na$(8)
   30 ONERRORGOTO60
   40 FORF%=1TO8:sc(F%)=100*(9-F%):na$(F%)="Beeb":NEXT
   50 REM
   60 MODE2:VDU23,1,0;0;0;0;:PROCINIT:PROCTITLE:MODE1:PROCINSTRUCT:MODE2
   70 FORF%=1TO8:READa%,b%:VDU19,a%,b%;0;:NEXT
   80 S%=0:LIVE%=2:YES%=0
   90 *FX12,1
  100 *FX11,1
  110 GCOL0,132:CLG:FORF=1TO4:A%(F)=1:DR%(F)=0:NEXT
  120 PROCWALLS
  130 PROCSETUP
  140 REPEAT
  150   PROCdrawup(64,720,16)
  160   IFGAME%=0 GOTO180
  170   PROCdrawup(720,64,-16)
  180   UNTILGAME%=0
  190 IFYES%=1 DIFF%=DIFF%-5:IFDIFF%<0 DIFF%=0
  200 IFYES%=1 YES%=0:SOUND2,3,99,50:GOTO110
  210 IFLIVE%=0 PROCENDTUNE:PROCSCORES ELSE LIVE%=LIVE%-1:GOTO130
  220 GOTO80
  230 DATA3,2,15,3,2,0,9,0,6,0,7,15,12,15,14,7
  240 DEFPROCdrawup(X%,T%,O%):GCOL3,10
  250 FORF%=X%TOT%STEPO%
  260   MOVE256,F%:PLOT1,56,0
  270   MOVE1024,F%:PLOT1,56,0
  280   *FX15,1
  290   IFINKEY(-98)PROCMOVEL:IFGAME%=0:F%=T%:GOTO360
  300   IFINKEY(-67)PROCMOVER:IFGAME%=0:F%=T%:GOTO360
  310   PROCLIFT
  320   *FX15,1
  330   A=INKEY(DIFF%)
  340   IFX1%=288AND(F%-128)MOD192<>0ORX1%=1056 AND(F%-128)MOD192<>0 THEN PROCFA
LL:F%=T%:GAME%=0:GOTO360
  350   GCOL3,10:MOVE256,F%:PLOT1,56,0:MOVE1024,F%:PLOT1,56,0
  360   NEXT
  370 ENDPROC
  380 DEFPROCLIFT
  390 UP%=INKEY(0)
  400 IFU%=1 AND X1%=672 AND UP%<>-67 ANDUP%<>-98 AND Z%=LEV%-64 THEN PROCUP(32)
  410 GCOL3,10:MOVE640,Z%:PLOT3,56,0
  420 IFD%=1 AND X1%=672 AND UP%<>-67 AND UP%<>-98 AND Z%=LEV%-64 THEN PROCUP(-3
2):GCOL3,10
  430 IFU%=1 ANDZ%<720 Z%=Z%+32:MOVE640,Z%:PLOT1,56,0:IFZ%=736 U%=0:D%=1:GOTO450
  440 IFD%=1 ANDZ%>64 Z%=Z%-32:MOVE640,Z%:PLOT1,56,0:IFZ%=64 U%=1:D%=0
  450 ENDPROC
  460 DEFPROCSETUP:A$=D$:B$=F$:G$=CHR$250:U%=1:D%=0:Z%=64:X1%=1216:GAME%=1:MAN%=
1216:LEV%=192:DIE=0
  470 COLOURO:COLOUR142:GCOL0,14:MOVE0,880:PLOT1,0,200:PLOT81,1280,-200:PLOT81,0
,200:VDU4:PRINTTAB(0,1);"LIVES";TAB(7,1);"£";TAB(14,1);"HI-£":VDU5:PROCSCORE:GCO
L0,3:IFLIVE%=0THEN480ELSEFORLI%=0TO(LIVE%-1)*72STEP72:MOVELI%,960:PRINTA$:NEXT
  480 GCOL3,6:PROCMAN(A$):GCOL0,0:C%=0:FORF%=160TO736STEP192:C%=C%+1:IFA%(C%)=1M
OVE0,F%:PRINT"£"
  490   NEXT:ENDPROC
  500 DEFPROCWALLS
  510 GCOL0,15:FORB%=-64TO1088STEP384:MOVEB%,64:PLOT1,0,736:PLOT81,31e,-736:PLOT
81,0,736:NEXT
  520 W=224:GCOL0,14
  530 FORI%=1TO2
  540   VDU5:FORX%=-64TO1280STEP384
  550     FORY%=128TO704STEP192
  560       MOVEX%,Y%
  570       IFX%<900 VDUW,W,W,W,W ELSE VDUW,W,W
  580       NEXT,
  590     GCOL0,1:W=253:NEXT
  600   ENDPROC
  610   DEFPROCUP(Z%):SOUND1,-15,53,1:GCOL3,6
  620   PROCMAN(A$)
  630   LEV%=LEV%+Z%:PROCMAN(A$)
  640   ENDPROC
  650   DEFPROCFALL
  660   GCOL3,6:PROCMAN(A$)
  670   FORFAL%=LEV%TO64STEP-16
  680     SOUND2,-15,5,1:LEV%=FAL%
  690     PROCMAN(A$)
  700     FORWT=1TO30:NEXT
  710     PROCMAN(A$)
  720     NEXT
  730   MOVEMAN%,FAL%:GCOL0,1:VDU230,231
  740   SOUND0,-15,4,10
  750   PROCAMB
  760   GCOL3,10:MOVE256,F%:PLOT1,56,0:MOVE1024,F%:PLOT1,56,0:MOVE640,Z%:PLOT1,5
6,0
  770   *FX15,1
  780   ENDPROC
  790   DEFPROCDIE
  800   IFX1%=288AND(F%+64)-LEV%<>0ORX1%=1056 AND(F%+64)-LEV%<>0 THEN DIE=1
  810   IFX1%=672 AND(Z%-128)MOD192<>0 THEN DIE=1
  820   IFDIE=1ANDA%(1)=0ANDA%(2)=0ANDA%(3)=0ANDA%(4)=0ANDLIVE%<>0 THENYES%=1:GA
ME%=0
  830   ENDPROC
  840   DEFPROCPICKUP:MAN%=0:PROCMAN(A$):A%(LEV% DIV 192)=0:A$=C$:B$=A$:G$=H$:MO
VE0,LEV%-32:GCOL0,15:PRINT"£":GCOL3,6:PROCMAN(A$)
  850   S%=S%+100:PROCSCORE
  860   SOUND1,-15,120,5
  870   ENDPROC
  880   DEFPROCDROP:MAN%=1216:PROCMAN(C$):A$=D$:B$=F$:G$=CHR$250:GCOL0,0:MOVE121
6,LEV%-32:PRINT"£":GCOL3,6:PROCMAN(A$):DR%(LEV% DIV192)=1:SOUND3,-15,120,5
  890   S%=S%+200:PROCSCORE
  900   IFDR%(1)=1ANDDR%(2)=1ANDDR%(3)=1ANDDR%(4)=1 THENYES%=1:GAME%=0:LIVE%=LIV
E%+1:S%=S%+500:PROCSCORE
  910   IFA%(1)=0ANDA%(2)=0ANDA%(3)=0ANDA%(4)=0 THENYES%=1:GAME%=0
  920   ENDPROC
```

```
  930   DEFPROCMOVEL:IFMAN%-32<1 THENENDPROC ELSEGCOL3,6
  940   IF(LEV%)MOD192<>0 THENDIE=1:GOTO970
  950   X1%=MAN%-32:PROCDIE:IFDIE=1:GOTO970
  960   IF(X1%+96) MOD384=0 S%=S%+10:PROCSCORE
  970   SOUND1,-15,200,1
  980   PROCMAN(A$)
  990   IFA$=C$ A$=E$:B$=E$:G$=I$
 1000   MAN%=MAN%-32:PROCMAN(B$):FORWT=1TO50:NEXT:PROCMAN(B$)
 1010   MAN%=MAN%-32:PROCMAN(A$)
 1020   IFMAN%=0 ANDA%(LEV% DIV 192)=1 ANDA$<>E$ THEN PROCPICKUP
 1030   IFDIE=1 PROCFALL:GAME%=0
 1040   ENDPROC
 1050   DEFPROCMOVER:IFMAN%+32>1200 THENENDPROC ELSEGCOL3,6
 1060   IF(LEV%)MOD192<>0 THENDIE=1:GOTO1090
 1070   X1%=MAN%+96:PROCDIE:IFDIE=1 THEN1090
 1080   IF(X1%+96) MOD384=0 S%=S%+10:PROCSCORE
 1090   SOUND1,-15,200,1
 1100   PROCMAN(A$)
 1110   IFA$=E$ A$=C$:B$=C$:G$=H$
 1120   MAN%=MAN%+32:PROCMAN(B$):FORWT=1TO50:NEXT:PROCMAN(B$)
 1130   MAN%=MAN%+32:PROCMAN(A$)
 1140   IFMAN%=1216 AND A$=C$ AND DR%(LEV% DIV192)=0 THENPROCDROP
 1150   IFDIE=1 PROCFALL:GAME%=0
 1160   ENDPROC
 1170   DEFPROCSCORE:VDU4:COLOUR3
 1180   PRINTTAB(7,2);S%;TAB(14,2);sc(1)
 1190   VDU5:ENDPROC
 1200   DEFPROCINIT
 1210   VDU23,224,255,129,129,255,12,12,255,0
 1220   VDU23,253,0,126,126,0,247,247,0,0
 1230   VDU23,225,0,28,28,28,8,62,93,157,23,226,157,157,28,20,20,20,20,60:A$=CHR
$225+CHR$10+CHR$8+CHR$226:D$=A$
 1240   VDU23,227,0,28,28,28,8,28,28,28,23,228,28,28,20,36,71,65,64,192:B$=CHR$2
27+CHR$10+CHR$8+CHR$228:F$=B$
 1250   VDU23,230,0,0,0,0,0,67,67,127,127,23,231,16,16,16,18,247,247,255,255
 1260   VDU23,232,224,240,224,66,229,233,232,254,23,233,232,232,255,48,8,16,32,1
12:C$=CHR$232+CHR$10+CHR$8+CHR$233
 1270   VDU23,234,7,15,7,2,231,151,23,127,23,235,23,23,255,12,16,8,4,14:E$=CHR$2
34+CHR$10+CHR$8+CHR$235
 1280   VDU23,240,0,127,127,127,127,127,28,8,23,241,0,224,224,224,254,254,112,32
,23,242,0,0,4,14,4,0,0,0,23,243,-1,-1,-1,-1,-1,-1,-1,-1
 1290   VDU23,250,0,0,20,0,0,0,0,0,23,251,32,0,0,0,0,0,0,23,252,4,0,0,0,0,0,0,
0:G$=CHR$250:H$=CHR$251:I$=CHR$252
 1300   ENDPROC
 1310   DEFPROCTITLE:COLOUR132:CLS
 1320   FTITLE$=" L I F T E R   "
 1330   NO%=0:FORF%=18TO3STEP-1
 1340     IFF%MOD2=0 X$=B$:COLOUR15 ELSEX$=A$:COLOUR1
 1350     NO%=NO%+1
 1360     TITLE$=LEFT$(FTITLE$,NO%):PRINTTAB(F%,8);X$;TITLE$;TAB(F%+1,8);" "
 1370     SOUND1,1,NO%*10,5:SOUND1,0,1,2:FORWT=1TO700:NEXT
 1380     NEXT
 1390   COLOUR13:PRINTTAB(0,20);"   Written Aug-83"''TAB(9)"by"''"   Roland Kitc
hing"
 1400   REPEAT A=INKEY(0):NO%=NO%+1:UNTILA<>-1ORNO%>2000
 1410   ENDPROC
 1420   DEFPROCINSTRUCT:COLOUR130:CLS:COLOUR0:PRINTTAB(12,1);"L I F T E R":COLOU
R1
 1430   PRINT'"  You control a man who you use to      collect the £'s at the le
ft hand side ofthe screen and deposit them on the righthand side, each  £  must
be left on a    different level."
 1440   COLOUR0:PRINT'"  You move the man by using:-"'"     Z.....to go left"'"
   X.....to go right"'"  You have three lives"
 1450   COLOUR1:PRINT'"  The man must cross three lifts to      pickup a £.The tw
o outside lifts do not carry him up or down but must be crossedwithout stopping
on them."
 1460   PRINTTAB(25,17);"The middle liftstakes him up or down and to pass this
lift he must take a ride on it."'"Pressing spacebar speeds up the lifts"
 1470   COLOUR0:PRINT'"  Points are scored as follows:-"''"  10points for each l
ift crossed"'"  100points for picking up a £"'"  200points for dropping a £"'"  500
points for completing a sheet":*FX15,0
 1480   PROCSPACE(10,31):ENDPROC
 1490   DEFPPOCENDTUNE:RESTORE1550
 1500   FOPC=1TO11
 1510     READA,B
 1520     SOUND1,1,A,B
 1530     SOUND1,0,1,1
 1540     NEXT:ENDPROC
 1550   DATA22,15,22,11,22,3,22,15,34,11,30,3,30,11,22,3,22,11,18,3,22,19
 1560   DEFPROCMAN(M$):MOVEMAN%,LEV%:PRINTM$:GCOL3,5:MOVEMAN%,LEV%:PRINTG$:GCOL3
,6:ENDPROC
 1570   DEFPROCAMB
 1580   SOUND1,2,100,MAN%/20
 1590   FORP%=0TOMAN%-192STEP64:MOVEP%,32:GCOL0,14:VDU240,241:GCOL0,1:VDU8,8,242
:FORWT=1TO300:NEXT:GCOL0,4:MOVEP%,32:VDU243,243:NEXT
 1600   MOVEP%,32:GCOL0,14:VDU240,241:GCOL0,1:VDU8,8,242
 1610   FORWT=1TO2000:NEXT
 1620   MOVEP%,32:GCOL0,4:VDU243,243:MOVEMAN%,FAL%:VDU243,243:SOUND1,2,100,(1280
-MAN%)/20
 1630   FORP%=MAN%-128TO1280STEP64:MOVEP%,32:GCOL0,14:VDU240,241:GCOL0,1:VDU8,8,
242:FORWT=1TO300:NEXT:GCOL0,4:MOVEP%,32:VDU243,243:NEXT
 1640   ENDPROC
 1650   DEFPROCSCORES:*FX12,0
 1660   VDU4:REPEAT:CLS
 1670     IFsc(8)>=S% PRINTTAB(2,24);"YOU SCORED ";S% ELSE PRINTTAB(0,10);"YOU A
PE IN THE TOP 8";TAB(2,12);"ENTER YOUR NAME":INPUTTAB(5,15),N$: UNTILLEN(N$)<10:
CLS
 1680   N%=0:REPEAT:N%=N%+1: UNTILsc(N%)<S% OR N%=8
 1690   IFsc(8)<S% n=9:REPEATn=n-1:sc(n)=sc(n-1):na$(n)=na$(n-1):UNTILn=N%:sc(n)
=S%:na$(N%)=N$
 1700   COLOUR11:PRINTTAB(2,2);"LIFTER HI-SCORES"'':COLOUR2
 1710   FORN=1TO8:PRINT;N;"..";sc(N);TAB(7);"...";na$(N)'
 1720     NEXT
 1730   COLOUR1:PROCSPACE(0,28)
 1740   ENDPROC
 1750   DEFPROCSPACE(F%,G%):PRINTTAB(F%,G%);"Press SPACE to play";:REPEAT:WT$=IN
KEY$(0):UNTILWT$=" ":ENDPROC
```







SOLITAIRE

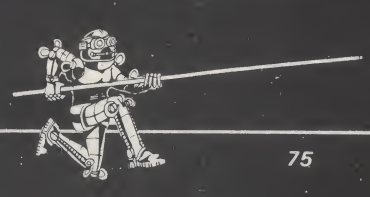
RUNS ON
BBC B
ELECTRON

This is a computer implementatiion of the old Board game with pegs. As the main program it uses mode 1. it should run on an Electron although this has not been tested.

The program is well structured and shows how arrays and flags can be used to represent a board. Enter your move by first specifying the row and then the colomn.

RUNdown

Lines	Action
20-30	Set up the user defined graphics for a peg and a space
40-100	Set up routines
105-320	Define 'board' in memory
340-370	Display board
390-520	Input sub routine
530-570	Update the array — the board in memory
580-720	Check that it is possible to make another legal move
750-800	Check for end program routine
810-960	PROC draw board — draws the board
990-1100	End of game for a win
1110-1210	End of game for a draw
1230-1480	Scores. Note change to mode 6 and lines 1410-1420 for the Electron



```
>L.
   10 REM***SOLITARE***
   15 REM***DEFINE GRAPHICS***
   20 VDU 23,224,255,255,255,255,255,255,255,255
   30 VDU 23,225,255,195,129,129,129,129,195,255
   40 DIM SCORES(10,2),NAMES$(10),BOARD(15,15)
   45 REM***INITIALISE ARRAY HOLDING SCORES AND TIMES***
   50 FOR I=1 TO 10
   60   SCORES(I,1)=84
   70   SCORES(I,2)=10000
   80 NEXT I
   90 NOOFPEGS=84
  100 MODE 1
  105 REM***DEFINE GRAPHICS WINDOW***
  110 VDU 24,0;300;1279;1023;
  115 REM***DEFINE TEXT WINDOW***
  120 VDU 28,0,31,39,24
  130 REM ***INITIALISE ARRAY REPRESENTING BOARD***
  140 FOR X=1 TO 15
  150   FOR Y=1 TO 15
  160     BOARD(X,Y)=-1
  170   NEXT Y
  180 NEXT X
  190 FOR I=3 TO 13
  200   FOR J=3 TO 13
  210     BOARD(I,J)=1
  220   NEXT J
  230 NEXT I
  240 FOR X=3 TO 5
  250   FOR Y=3 TO 5
  260     BOARD(X,Y)=-1
  270     BOARD(X+8,Y)=-1
  280     BOARD(X,Y+8)=-1
  290     BOARD(X+8,Y+8)=-1
  300   NEXT Y
  310 NEXT X
  320 BOARD(8,8)=0
  340 REM***PLAY GAME***
  345 TIME=0
  350 REPEAT
  360   PROCDRAWBOARD(BOARD)
  370   VDU 4
  390 REM***INPUT MOVE AND CHECK THAT IT IS LEGAL***
  400   PRINT'"NEXT MOVE PLEASE"
  410   INPUT'"FROM",ROW1,COLUMN1$
  420   VDU 7
  430   COLUMN1=ASC(COLUMN1$)-62
  440   IF ROW1>11 OR ROW1<1 OR COLUMN1>13 OR COLUMN1<3 THEN PRINT"INVALID MOVE"
:GOTO 410
  450   IF BOARD(COLUMN1,ROW1+2)=-1 THEN PRINT"INVALID MOVE":GOTO 410
  460   INPUT'"TO",ROW2,COLUMN2$
  470   VDU 7
  480   COLUMN2=ASC(COLUMN2$)-62
  490   IF ROW2>11 OR ROW2<1 OR COLUMN2>13 OR COLUMN2<3 THEN PRINT"INVALID MOVE"
:GOTO 410
  500   IF BOARD(COLUMN2,ROW2+2)=-1 THEN PRINT "INVALID MOVE":GOTO 410
  510   IF ABS(ROW2-ROW1)+ABS(COLUMN2-COLUMN1)>2 THEN PRINT"INVALID MOVE":GOTO 4
10
  520   IF BOARD(COLUMN1,ROW1+2)<>1 OR BOARD(COLUMN2,ROW2+2)<>0 OR BOARD((COLUMN
1+COLUMN2)/2,(ROW1+ROW2)/2+2)<>1 THEN PRINT "INVALID MOVE":GOTO 410
  530 REM***ALTER RELEVENT ELEMENTS OF ARRAY***
  540   BOARD(COLUMN1,ROW1+2)=0
  550   BOARD(COLUMN2,ROW2+2)=1
  560   BOARD((COLUMN1+COLUMN2)/2,(ROW1+ROW2)/2+2)=0
  570   NOOFPEGS=NOOFPEGS-1
  580 REM***CHECK IF THERE ARE ANY MORE POSSIBLE MOVES***
  590   NOGOES=TRUE
  600   EXITLOOP=FALSE
  610   I=3
  620   J=3
  630   REPEAT
  640     IF I=13 AND J=13 THEN EXITLOOP=TRUE
  650     IF BOARD(I,J)=1 AND BOARD(I-1,J)=1 AND BOARD(I-2,J)=0 THEN NOGOES=FALS
E:GOTO 700
  660     IF BOARD(I,J)=1 AND BOARD(I,J+1)=1 AND BOARD(I,J+2)=0 THEN NOGOES=FALS
E:GOTO 700
  670     IF BOARD(I,J)=1 AND BOARD(I+1,J)=1 AND BOARD(I+2,J)=0 THEN NOGOES=FALS
E:GOTO 700
  680     IF BOARD(I,J)=1 AND BOARD(I,J-1)=1 AND BOARD(I,J-2)=0 THEN NOGOES=FALS
E:GOTO 700
  690     IF I<13 THEN I=I+1 ELSE IF J<13 THEN I=3:J=J+1
  700   UNTIL (NOT NOGOES) OR EXITLOOP
  710 UNTIL NOOFPEGS=1 OR NOGOES
  720 PLAYERTIME=TIME
  730 PROCDRAWBOARD(BOARD)
```

```
 740 VDU 4
 750 IF NOOFPEGS=1 AND BOARD(8,8)=1 THEN PROCWON ELSE PROCFINISH
 760 MODE 7
 770 PROCSCORES
 780 PRINT'"HIT 'SPACE' TO START AGAIN";
 790 IF GET<>32 THEN GOTO 790 ELSE GOTO 90
 800 END
 810 REM*********************************
 820 DEF PROCDRAWBOARD(BOARD)
 830 REM***DRAW SOLITARE BOARD***
 840 LOCAL I,J
 860 VDU 5
 870 FOR J=3 TO 13
 880   FOR I=3 TO 13
 885 DX=1023-I*60+2:DY=1023-J*60+100
 890 MOVEDX,DY:GCOL0,0:PRINTCHR$(224):MOVEDX,DY:GCOL0,7:IF BOARD(16-I,J)=0 THEN
PRINTCHR$(225) ELSE IF BOARD(16-I,J)=1THENPRINTCHR$(224)
 900   NEXT I
 910 NEXT J
 920 MOVE 0,1023:PRINT"       A B C D E F G H I J K"
 930 FOR I=1 TO 11
 940   MOVE -150,1023-I*60-20:PRINTI
 950 NEXT I
 960 ENDPROC
 970 REM*********************************
 980 DEFPROCWON
 990 REM***PRINTS "GAME WON" MESSAGE***
1000 CLS
1010 VDU 19,1,11,0,0,0
1020 COLOUR 1
1030 PRINT TAB(13) "YOU HAVE WON!!"
1040 PRINT'"          YOU TOOK ";PLAYERTIME DIV 100;" SECONDS."
1050 FOR I=1 TO 3
1060   FOR PITCH=1 TO 250 STEP 10
1070     SOUND1,-10,PITCH,1
1080   NEXT PITCH
1090 NEXT I
1100 ENDPROC
1110 REM*********************************
1120 DEFPROCFINISH
1130 REM***PRINTS "STALEMATE" MESSAGE***
1140 COLOUR 1
1150 CLS
1160 IF NOOFPEGS>1 THEN PRINT"THERE ARE ";NOOFPEGS;" PEGS LEFT AND YOU CANNOT
  MOVE." ELSE PRINT"THERE IS ";NOOFPEGS;" PEG LEFT AND YOU CANNOT MOVE."
1170 PRINT'"YOU TOOK ";PLAYERTIME DIV 100;" SECONDS."
1180 REM***DELAY LOOP***
1190 TME=TIME
1200 REPEAT UNTIL TIME>TME+500
1210 ENDPROC
1220 REM*********************************
1230 DEFPROCSCORES
1240 LOCAL I
1250 IF NOOFPEGS>SCORES(10,1) OR (NOOFPEGS=SCORES(10,1) AND PLAYERTIME>=SCORES(
10,2)) THEN GOTO 1300
1255 REM***FLUSH ALL INPUT BUFFERS***
1260 *FX15,0
1270 INPUT "WHAT IS YOUR NAME",PLAYER$
1280 VDU 7
1290 IF LEN(PLAYER$)>10 THEN GOTO 1270
1300 NAMES$(10)=PLAYER$
1310 SCORES(10,1)=NOOFPEGS
1320 SCORES(10,2)=PLAYERTIME DIV 100
1330 REM ***SORT SCORES***
1340 I=10
1350 FINISHED=FALSE
1360 REPEAT
1370   IF SCORES(I,1)>SCORES(I-1,1) OR (SCORES(I,1)=SCORES(I-1,1) AND SCORES(I,
2)>=SCORES(I-1,2)) THEN FINISHED=TRUE ELSE TEMPNUMBER=SCORES(I-1,1):TEMPTIME=SCO
RES(I-1,2):TEMPNAME$=NAMES$(I-1)
1380   IF NOT FINISHED THEN SCORES(I-1,1)=SCORES(I,1):SCORES(I-1,2)=SCORES(I,2)
:NAMES$(I-1)=NAMES$(I):SCORES(I,1)=TEMPNUMBER:SCORES(I,2)=TEMPTIME:NAMES$(I)=TEM
PNAME$:I=I-1
1390 UNTIL FINISHED OR I=1
1400 CLS
1410 PRINT CHR$(141);CHR$(129);"              SOLITARE              "
1420 PRINT CHR$(141);CHR$(129);"              SOLITARE              "
1430 REM***PRINT TOP TEN SCORES***
1440 PRINT'"NO. SCORE   TIME"
1450 FOR I=1 TO 10
1460   PRINT TAB(0,I*2+2);I;TAB(6);SCORES(I,1);TAB(12);SCORES(I,2);TAB(21);NAME
S$(I)
1470 NEXT I
1480 ENDPROC
>
```

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VIDEO VIEWING

Donky Kong Junior

Runs on the Colecovision
Price £29.00

Donkey Kong must surely rate as one of the most complicated games to work out that is in existance probably rivalled only by Defender for complexity.

If you are unfamiliar with the original arcade game it is vital to read through the instruction leaflet thoroughly, otherwise you will find the game a total and utter mystery. The game centres around the character of Donkey Kong, his dad and somebody called Mario. You have to release Donkey Kong from a cage located at the top of the screen by making Junior cross a jungle swinging along from vine to vine while avoiding nasty creatures lurking around.

To start the game you again are given a choice of skill to select your own. If you haven't played it before then level one is the best to begin with. Next comes the game itself. Junior begins in the bottom left corner of the jungle and has to travel onto platforms and jump onto vines in order to move across and up to the top of the screen. Here you find a flashing key which Junior must take in order to unlock the door of the cage.

It's not easy to get there though. On your journey you'll find loads of little red and blue snapjaws which chomp their way along the screen scenario just waiting for Junior to walk into his jaws. The way to get rid of them is to knock Junior onto one of the fruits directly above the snapjaws and they will instantly disappear.

And when you try to capture the flashing key even more of these snapjaws are sent by Mario to entrap you. At this point you can avoid them by making Junior jump over them, but make sure your timing is perfect or else you will land smack on top of them. And then it's sudden death.

Don't think things will get easier now that you've got the key. They only get worse, to my way of thinking anyway. The screen scene changes and you are shown a picture of Donkey Kong locked up in his cage rattling the bars to escape. Linked to the cage are a number of huge chains. At the bottom of some of these chains are keys which Junior must push up into the locks at the top of the chains in order to free his big daddy.

But now Junior not only has the dreaded snapjaws to contend with but he also has to watch out for the Nitpicker birds which fly across the screen and gobble up Junior if he gets in their way. They have a dirty trick of swooping down from Mario's platform and catching Junior on the chains.

And if you successfully manage to complete that mission and unlock the unhappy Donkey Kong from the cage things go from bad to worse. You now start all over again but with many more obstructions and opponents. After the second mission Junior goes for the jump board challenge. Things move the whole time, like the chains and the platforms and Junior has to make super sized leaps to reach the moving platform.

At this level you have to deal with the Stockybirds which drop eggs and eliminate poor Junior. He can retaliate by dropping fruits on them. And after that it just gets more complicated.

It's certainly a good game to get to grips with and has many devoted fans who sit glued to their game for hours. And it's probably worth spending time to learn just how to play it. Regular Donkey Kong players say that this version of the arcade original is very good and reasonably faithful to it. Definitely one for all the family to have a go at.

Tutankham

Runs on the Atari 2600 VCS

Psssst! Want to find the spirits of the moon god Thoth? Or a ring with the emblem of a scribe during the reign of Thutmoses III? How about the blue condors of the sky god Horus? None of these wonders holds a candle, however, to the vicious turtles of the Tomb of Tutankham, and you'll meet all of them as you stagger through the four chambers that lead you to the ultimate treasure.

One of the problems with all these adventure games is the amount of reading that you have to do even before you touch the joystick. One of the best things in life for a video game reviewer is to get a new cartridge, ignore the instructions, and get stuck in, trying to live by wits and ingenuity alone. The more lists the manuals carry the more bogged down in detail the game becomes. Reading them though is essential, or the reaction to being unable to get past even the first obstacle is to punt the entire console out of the window in disgust.

Basically, the 'scenario' is the Egyptian tomb of Tutankham (silly name, and it doesn't fool anyone) where you, as an archeologist are seeking treasure, and keys to the next secret chamber. Giant bats, killer moths, deadly viruses and a partridge in a pear tree (shurely shome mishtake here — Ed) all try and stop you from doing any of these things. You aren't entirely on your own of course, as you have three lives, several laser blasts and a comprehensive manual to work with.

There are eight game selections (four for one player, and four for two) with four different levels of difficulty in each selection. There are four chambers to negotiate as well, each one harder than the last. A sort of 'Raiders of the Lost Art' meets 'Adventure', so if you've already got those two, this will hold no surprises.... except for the vicious turtles! Made by Parker.



Q-Bert

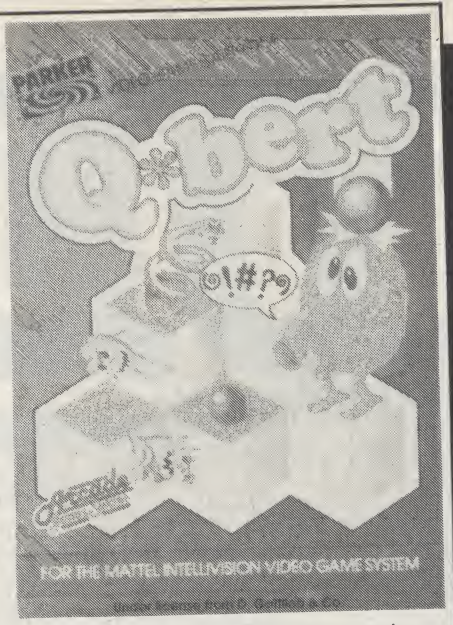
Runs on the Atari 2600

Where, in heavens name, do they get their names from? It seems that the sillier the name, the more likely the game is to become a cult hit in the arcades (and hopefully for the manufacturers, in the home). I mean would you go and ask for a pint of 'Zaxxon' in a crowded bar? In that case, mine's a Cherry B, mate.

Name aside, the game isn't at all bad, if you can stand the rather cutesy-pie 'Play School' mentality that seems to have been the basis of the idea. You start with four 'Q-berts' at the top of a pyramid of cubes (hold the phone — 3D graphics!), and the aim of the game is to pilot him down the pyramid, changing the colour of each of the cubes as he touches them.

When you've completed the pyramic in the new colour scheme, you move on to the next level, where things move a little faster. Obstacles include a load of balls — honest! Green balls are OK, red balls are to be avoided at all costs, and purple ones could leave you in a lot of trouble. Snakes hatch out of some of them (I forget which colour) and they too can eat or be eaten.

Confused? Wait till you play the game. The main difficulty is conquering the 3D graphics, and many 'Q-Berts' were plunged to their untimely



deaths before I managed to work out what was going on. Sometimes it takes more than one jump to change the colour of the cubes, so read the instructions carefully. A test of your memory as much as manual dexterity, but providing is isn't taken seriously (now, Johnny, don't do that to little Samantha, she mightn't like it) the effects won't be permanently damaging! Made by Parker Games, this is one of the firm's latest batch.

Space Fury

Runs on the Colecovision
Price £29.00

Space Fury was certainly christened aptly. It is sheer fury on your TV screen when you plug in and switch on this game from Colecovision.

Based on the highly sucessful arcade game of Asteroids (and also any arcade game in its own right), Space Fury revolves round the focal point of a space ship (just for a change)! It's placed in the centre of the screen and is under your control — using the special Colecovision joysticks. Before you start the game proper you must select one of the eight skill levels to play. This seems to be a feature of most of the Colecovision games. Having done that you're confronted with a title screen.

This sequence received different reactions from people in the office watching. But the vast majority of people hated it! It consists of a brightly coloured head with one giant eye and a continuous stream of burble telling you what to expect in the game. That's the 'dreaded alien commander' by the way.

Now let battle commence and defend your triangular ship by firing at the enemy craft which whistle towards you. First of all you have to destroy the alien scouts which are small green ships that look a bit like kryptonite. If you don't obliterate these they will form into larger ships which on contact with your ship will destroy it. They also release fireballs which spell much more danger.

The best tactic to adopt is to keep your finger constantly on the fire button. And at the same time keep an eye out for the ships so that you can swivel your own ship round to fire at them with deadly accuracy. All the enemy craft drift round the screen and home in on your ship with the sole intent of destroying it. Once you have successfully wiped out the bands of alien scouts you move on to the next screen which involves docking your ship with a mother ship. The docking process isn't difficult and it gives you the extra facility of an energy boost. This is vital to survive the following round of the game. There are three mother ships in total and these give you the choice of firing in different ways. Try them all out to find which suits your style of play best.

Now you can blast away to your hearts content at the alien cruisers and if successfully completed you have to dock with another mother ship. The purpose of this task is to gain more firepower in order to try and kill the alien commander's destroyers and warships which are sent out on sorties.

As with all these arcade type of games you earn points for yourself each time you destroy one of the enemy's craft. And the harder they are to shoot down the more points you are awarded. As the difficulty of the game increases the points awarded are increased too.

Unfortunately, although this game's concept was rather different there was something lacking in the addictive aspect of it. Nevertheless the graphics were good and the game would probably be more enjoyable if the Colecovision joysticks weren't so hard to handle.

Return of The Jedi (Death Star Battle)

Runs on the Atari 2600 VCS

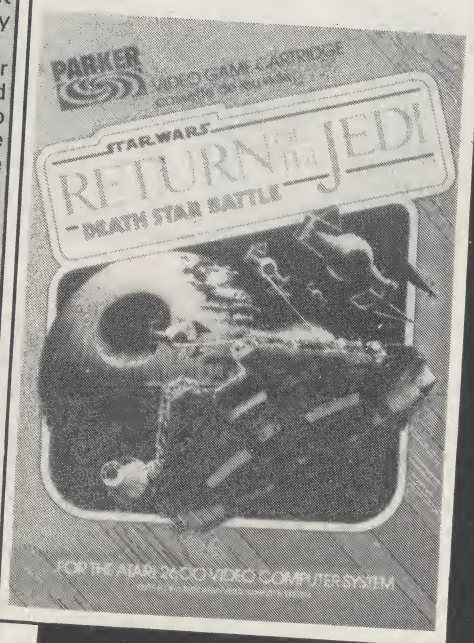
Forget all about those sickeningly coy 'Ewoks' in the film, this game is all about trying to blast a half-built Death Star from the skies. Come to think of it, perhaps blasting away at Ewoks might be more fun.

Meanwhile, back at the controls of the Millenium Flacon (or Falcon), Tie Interceptors are swooping in from left and right trying to destroy you, so you have to be a bit nimble on the old plates of meat just to stay alive. In addition, you have to avoid the energy shield when it appears, keeping the Falcon in the lower half of the screen. When you've blasted a hole in this, you get into hyperspace, and that much nearer to the Death Star.

Knocking out the DS isn't easy, especially as you have to have eyeballs in very unusual anatomical places to stay alive, owing to the attacking Interceptors, Imperial Shuttles and the like. At the same time, you have to knock out the Death Star piece by piece, avoiding the Death Ray. Of course, the loonies... sorry, evil despots, building the Death Star keep plugging away, constantly rebuilding it.

Even if you do become Sutton Coalfield's answer to Luke Skywalker, and manage to blow up the Star, you still have to avoid the resulting mess and fireballs to stay alive. After scoring 10,000 things hot up a little more, with faster, more lethal Interceptors, a speedier reaction from the Death Ray, and faster rebuilding of the Death Star.

The Atari's blocky graphics are much more suited to the portrayal of next-century hardware than cuddly animals, so this game is bags of fun. Lots of pretty colours when things go 'bang', and very satisfying 'crumps', 'weeeeows, and 'bokka — thuds' on the soundtrack. (Final Note — watch out for the devilishly clever illustrations in the games manual, as they're printed upside down!)



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This is a board game for two players, in this case you and the computer. It is played by placing pieces on the board which outflank the opponents pieces in order to capture them. Capturing one of the computer's pieces scores one point for you and removes one point from the computer's score.

The direction of capture may be in any straight line. If a piece cannot be played which will capture one or more of the computer's piece(s), the turn must be forfeited. This is done by entering "0" at the prompt "enter move". Your pieces are white dots on a dark red background. The computer's pieces are black dots on a cyan background. The game ends when there are no more moves possible for either you or the computer.

When you run the program the screen is cleared and the background colour will change from light blue to light yellow. The board is displayed on the screen. It is made of sixty-four black foreground on a grey background user defined squares. The border is made of black characters on a green background, with rows numbered from one to eight and columns lettered from A to H. Two of the computer's pieces are printed at D5 and E4. The scores are set to two each and printed under the headings "computer" and "player".

Messages are displayed at the bottom of the screen. The characters being black on a green background. Now the computer will ask "enter skill level from 1,2 or 3". 1 is the easiest and 3 the hardest level.

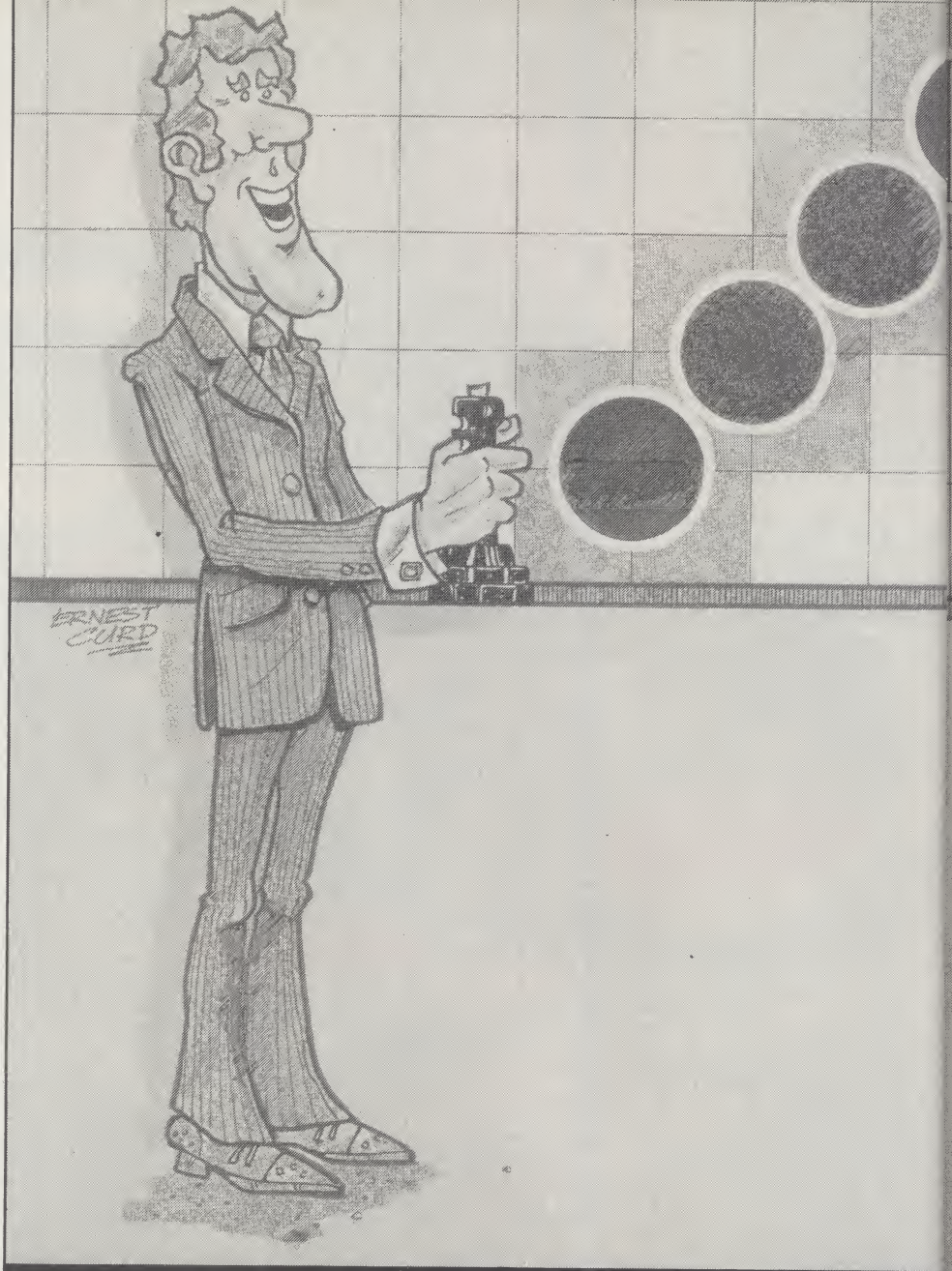
The computer will not accept any character other than 1,2 or 3. The level you choose will be printed on the message line. You will make the first move by entering a letter and a number in response to the prompt "enter move". You *must* wait until the letter you have entered is printed on the message line before you try to enter the number. Error messages will be printed if you try to enter a letter outside the range A to H (note you must only use uppercase letters) or a number outside the range 1 to 8 or enter an invalid move. When you have entered your move the computer will "fill in" the captured squares with pieces of your colour. Then it will adjust and print both scores. The message "computer" will be printed to indicate that the computer is working out its move.

When the computer has decided on its move, it will print the move's coordinates on the message line and emit a note of one second duration. Having gained your attention, the computer will allow you to examine the board before it "fills in" the captured squares and changes the scores. Note the computer will take approximately one and a half minutes to make its move. The prompt "enter move" will appear on the message line and you can enter your next move. When both you and the computer cannot move the game will end. The choice of endgame messages are:-

"Congratulations you have won"
"I have won"
"Draw".

The computer will wait a few seconds before asking you:-

"Do you want to play again (Y or N)." You must answer Y for yes or N for no.



REV

RUNdown

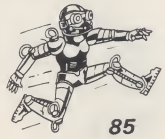
Lines	Action
100- 140	Dimension arrays.
150	Goto start of program at 620.
160- 190	Clear message line subroutine.
200- 370	Converts the score to a string subroutine. The score can then be printed by the message print subroutine.
380- 610	Print message subroutine. Prints the string A$ at the specified location on the screen.
620-1180	Set up initial display routine. Clears the screen and prints the Othello board on the display.
1190-1360	Enter skill level routine. 1 is the easiest level and 3 the hardest level. There is a built in delay to allow the player to see the skill level he has chosen to be printed on the message line.
1370-1470	Print "enter move" without scrolling the screen.
1480-1640	Enter valid letter routine. An error message will appear if an invalid letter is entered.
1650-1680	Print chosen letter.
1690-1860	Enter valid number routine
1870-1900	Print chosen number.



ERSI

RUNS ON TI/994A

1910-1920	Convert player's move to a position on the screen that the computer can understand.
1930-2000	Set up variables to calculate and print on the board the player's captured squares, or set up variables to calculate the computer's captured squares.
2010-3880	Calculate and print the captured squares for both the computer's moves and the player's move.
3890-3980	Does the player's move capture any of the computer's squares? If no squares are captured print "invalid move" and go to enter move routine.
3990-4010	Calculate and print the scores as a result of the player's move.
4020	Has the computer lost as a result of the player's move? If it has, goto endgame messages.
4030-4050	Has the board been filled up as a result of the player's move? If it has goto endgame messages.
4060-4150	Print "computer" on the message line without scrolling the screen.
4190-4430	The computer examines every square on the board. If it can capture any of the player's pieces by moving to a particular square, it records the number of captured pieces and the location of that move. It also applys a simple tactical check for skill levels 2 and 3 to every valid move and acts accordingly.
4440-4680	The computer compares "the number of captured pieces" for each square on the board with the move that captures the maximum number of pieces. The move that captures the maximum number of pieces is initially at A8. Even if this is an invalid move i.e. it captures no pieces. If the number of captured pieces for a particular move is higher than or equal to the maximum number of captured pieces, this move becomes the new maximum number of captured pieces and is stored for future use. If you are playing at skill level 3 certain tactical squares are avoided unless there is no alternative move.
4690-4740	If the computer cannot move it checks to see if skill level 3 has been chosen. If it has it checks to see if the tactical squares have been avoided. If they have the computer disables the tactical square avoidance routine and checks to see if it can move. If it cannot move the computer forfeits its move.
4750-4900	The computer chooses the move that will capture the maximum number of player's squares. If there is more than one move that will capture the maximum number of player's squares it makes a random choice from these moves.
4910-5360	Print the computer's move on the message line.
5370	The computer activates the sound generator to alert the player to the fact that it is about to make its move.
5390-5470	Cannot move routine.
5480-5530	Built in delay. Print computer's captured squares on the board.
5540-5560	Adjust and print scores as a result of the computer's move.
5570	If the player has lost as a result of the computer's move goto endgame messages.
5580	If the board has been completely filled as a result of the computer's



	move goto endgame messages. If not goto enter move routine.
5590-5840	Endgame messages.
5850-5930	Do you want to play again routine. Y for yes and N for no.
5940-5970	If you are playing at skill level 3 and the computer has been forced to disable its tactics this routine enables the tactics ready for the computer's next move.

Conversion Clues

This program hinges on the fact that the Texas has a memory mapped display. All the information which the computer needs to make its move is stored in the memory mapped display, i.e. the section of the screen which displays the Othello board. It is for this reason that I had to write a print routine which *did not* scroll the screen when it displayed messages. Most of the basic commands used are common to all variations of Basic. Those TI Basic commands which are unusual will now be explained.

CALL COLOR	TI Basic allows you to divide the ASCII characters into 16 character sets. The foreground and background colour of each "set" of characters can then be fixed using this command. This system of colour coding caused a problem when a space was printed on the message line. The majority of the screens background colour would completely change to the background colour specified in this command when a space was printed for the first time. I overcame this problem by defining my own space character in a different character set and inserting this instead of a space whenever a space was detected in a message.
CALL CHAR	Allows you to define your own characters. If this is not possible on your machine you can use, say, spaces for the board and perhaps "0" and "X" for the pieces.
CALL HCHAR VCHAR	Are TI Basic graphic commands which can repeatedly print the same character horizontally or vertically on the screen. They can be replaced by the more usual "POKE" command.
CALL GCHAR	Is another TI-Basic graphics command. It can be replaced by the more usual "PEEK" command.
IF THEN ESLE	Is unusual. It can easily be replaced by e.g. 10 if A=1 then 30 20 goto 60 30 60
CALL KEY	Is a TI-Basic command which allows you to check the keyboard to see a key has been pressed. The VIC 20 uses a similar command called "GET".
SEG $	Is more usually called mid $.
A$	This string variable holds the message to be printed on the message line.
W	Is the number of digits in the score i.e. one or two.
B$	Holds AO, which is printed before the one digit score.
ROW	Is the row position of a character on the screen. Starting at the top of the screen is row 1 and finishing at the bottom of the screen is row 24.
COL	Is the column position of a character on the screen. Starting at the lefthand side of the screen is column 1 and finishing at the righthand side of the screen is column 32.
D	Is the number of characters (including spaces) in the message. A$ holds the message.
E(1...65)	Holds the ASCII value of each character.
F	Number of the segment of the array.
B	Number of the segment of the array.
D2	Is the character set number.
H	Is the number of a character (referenced to the first ASCII character — the space) within a specific character set.
C	Is the ASCII value of a character.
C1	Is the computer's score.
P1	Is the player's score.
FLAG	Flag indicates whose move it is. If flag = 136 it is the player's move. If flag = 144 it is the computer's move. The values 136 and 144 are user defined ASCII characters.
STATUS	Is used in conjunction with the TI-Basic CALL key. If status = 0 no key has been pressed. −1 the same key. 1 new key.
G	Is the control variable which only allows a range of ASCII characters to be accepted, via the keyboard, in response to a message
Q	Is the skill level (1,2, or 3).
O	Is the delay variable.
Y	If Y=2 the score is worked out in the captured squares subroutine.
Z	If Z=2 the captured squares are printed on the board.
LTR	The ASCII letter which has been entered by the player in response to the "enter move" routine.
H1	Is the control variable which only allows a range of ASCII characters (1 to 8) to be accepted, via the keyboard in response to the message "enter number between 1 and 8".
SRE	Is the opposite value of "flag" i.e. if flag = 136, SRE = 144 and if flag = 144 SRE = 136.
S	Is the number of captured squares.
J	Row.
K	Column.
RPT	Allows for the fact that the minimum number of captured squares is two. RPT is the number of captured squares in **one** of the possible eight straight lines.
T	Allows for the fact that the square being evaluated will be counted several times if there are captured squares in more than one straight line.
TYPE	Is used in conjunction with the CALL GCHAR command which looks at a specified location in the memory mapped screen. The computer sets the variable type to the ASCII value of the character at that location.
A4	If you are playing at skill level 3 A4=1 is a flag which tells you that avoidance tactics are activated. If A4=2 the avoidance tactics have been disabled for the duration of the computer's current move.
X	Number of the segment of the array.
SCO(1...65)	Is the array containing the number of captured pieces for every move on the board.
RW(1...65)	Is the row of the move on the board.
CL(1...65)	Is the column of the move on the board.
V	Number of the segment of the array.
I	Is the number of the segment of "the maximum captured squares" array M.
M 1...35)	The maximum captured squares array.
R2(1...35)	The row of the maximum captured squares move.
C2(1...35)	The column of the maximum captured squares move.
U	Is the variable which matches the board letter and number coordinates with the computer's row and column coordinates.



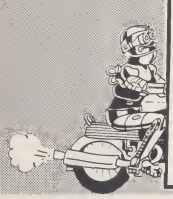
LISTING

```
100 REM BY EDDIE ILLINGWORTH
110 DIM SCO(65)
120 DIM RW(65)
130 DIM CL(65)
140 DIM M(65)
150 GOTO 620
160 REM  CLEAR LINE ROUTINE
170 CALL HCHAR(23,3,152,30)
180 CALL HCHAR(24,3,152,30)
190 RETURN
200 REM   PRINT SCORES
210 A$=STR$(C1)
220 W=LEN(A$)
230 IF W=1 THEN 240 ELSE 260
240 B$="0"
250 A$=B$&A$
260 ROW=14
270 COL=6
280 GOSUB 380
290 A$=STR$(P1)
300 W=LEN(A$)
310 IF W=1 THEN 320 ELSE 340
320 B$="0"
330 A$=B$&A$
340 ROW=14
350 COL=26
360 GOSUB 380
370 RETURN
380 REM   PRINT MESSAGE ROUTINE
390 D=LEN(A$)
400 DIM E(65)
410 FOR F=1 TO D
420 E(F)=ASC(SEG$(A$,F,1))
430 IF E(F)=32 THEN 440 ELSE 450
440 E(F)=152
450 NEXT F
460 FOR B=1 TO D
470 D2=1
480 H=E(B)-31
490 IF H<9 THEN 500 ELSE 510
500 GOTO 540
510 D2=D2+1
520 H=H-8
530 GOTO 490
540 CALL COLOR(D2,2,4)
550 CALL HCHAR(ROW,COL,E(B))
560 COL=COL+1
570 IF COL=33 THEN 580 ELSE 600
580 COL=3
590 ROW=24
600 NEXT B
610 RETURN
620 CALL CLEAR
630 CALL SCREEN(12)
640 CALL CHAR(128,"007E424242427E00")
650 CALL CHAR(136,"0000003C3C000000")
660 CALL CHAR(144,"0000003C3C000000")
670 CALL CHAR(152,"")
680 CALL COLOR(16,2,4)
690 CALL HCHAR(8,12,152)
700 CALL HCHAR(17,12,152)
710 CALL HCHAR(17,21,152)
720 CALL HCHAR(8,21,152)
730 FOR ROW=8 TO 17 STEP 9
740 CALL COLOR(5,2,4)
750 COL=13
760 C=65
770 CALL HCHAR(ROW,COL,C)
780 COL=COL+1
790 C=C+1
800 IF C=72 THEN 810 ELSE 820
810 CALL COLOR(6,2,4)
820 IF COL<21 THEN 770
830 NEXT ROW
840 FOR COL=12 TO 21 STEP 9
850 CALL COLOR(3,2,4)
860 ROW=16
870 C=49
880 CALL VCHAR(ROW,COL,C)
890 ROW=ROW-1
900 C=C+1
910 IF C=56 THEN 920 ELSE 930
920 CALL COLOR(4,2,4)
930 IF ROW>8 THEN 880
940 NEXT COL
950 CALL COLOR(13,2,15)
960 FOR ROW=9 TO 16
970 CALL HCHAR(ROW,13,128,8)
980 NEXT ROW
990 CALL COLOR(14,16,7)
1000 CALL HCHAR(12,16,136)
1010 CALL HCHAR(13,17,136)
1020 CALL COLOR(15,2,8)
1030 CALL HCHAR(12,17,144)
1040 CALL HCHAR(13,16,144)
1050 A$="COMPUTER"
1060 ROW=12
1070 COL=3
1080 GOSUB 380
1090 A$="PLAYER"
1100 ROW=12
1110 COL=24
1120 GOSUB 380
1130 C1=2
1140 P1=2
1150 GOSUB 200
1160 FLAG=136
1170 CALL HCHAR(16,6,144,2)
1180 CALL HCHAR(16,26,136,2)
1190 GOSUB 160
1200 A$="ENTER SKILL LEVEL FROM 1,2 OR 3"
1210 ROW=23
1220 COL=3
1230 GOSUB 380
1240 CALL KEY(0,SKILL,STATUS)
1250 IF STATUS=0 THEN 1240
1260 FOR G=49 TO 51
1270 IF G=SKILL THEN 1300
1280 NEXT G
1290 GOTO 1190
1300 Q=SKILL-48
1310 A$=CHR$(G)
1320 ROW=24
1330 COL=17
1340 GOSUB 380
1350 FOR O=1 TO 500
1360 NEXT O
1370 GOSUB 160
1380 CALL HCHAR(23,3,69)
1390 CALL HCHAR(23,4,78)
1400 CALL HCHAR(23,5,84)
1410 CALL HCHAR(23,6,69)
1420 CALL HCHAR(23,7,82)
1430 CALL HCHAR(23,8,152)
1440 CALL HCHAR(23,9,77)
1450 CALL HCHAR(23,10,79)
1460 CALL HCHAR(23,11,86)
1470 CALL HCHAR(23,12,69)
1480 FLAG=136
1490 Y=2
1500 Z=2
1510 CALL KEY(0,LTR,STATUS)
1520 IF STATUS=0 THEN 1510
1530 IF LTR=48 THEN 4060
1540 FOR G=65 TO 72
1550 IF G=LTR THEN 1650
1560 NEXT G
1570 GOSUB 160
1580 A$="ENTER LETTER BETWEEN A AND H"
1590 COL=3
1600 ROW=23
1610 GOSUB 380
1620 FOR O=1 TO 500
1630 NEXT O
1640 GOTO 1370
1650 A$=CHR$(G)
1660 ROW=23
1670 COL=17
1680 GOSUB 380
1690 CALL KEY(0,NBR,STATUS)
1700 IF STATUS=0 THEN 1690
1710 FOR H1=49 TO 56
1720 IF H1=NBR THEN 1870
1730 NEXT H1
1740 GOSUB 160
1750 A$="ENTER NUMBER BETWEEN 1 AND 8"
1760 ROW=23
1770 COL=3
1780 GOSUB 380
1790 FOR O=1 TO 500
1800 NEXT O
1810 GOSUB 160
1820 A$="ENTER MOVE"
1830 ROW=23
1840 COL=3
1850 GOSUB 380
1860 GOTO 1650
1870 A$=CHR$(H1)
1880 ROW=23
1890 COL=19
1900 GOSUB 380
1910 COL=LTR-52
1920 ROW=65-NBR
1930 REM  CALCULATE CAPTURED SQUARES
1940 IF FLAG=136 THEN 1950 ELSE 1960
1950 SRE=144
1960 IF FLAG=144 THEN 1970 ELSE 1980
```





```
1970 SRE=136
1980 J=ROW
1990 S=0
2000 T=-1
2010 K=COL
2020 RPT=2
2030 CALL GCHAR(ROW,COL,TYPE)
2040 IF TYPE=FLAG THEN 2050 ELSE 2130
2050 A$="YOU ALREADY OWN THIS SQUARE"
2060 ROW=23
2070 COL=3
2080 GOSUB 160
2090 GOSUB 380
2100 FOR O=1 TO 500
2110 NEXT O
2120 GOTO 1370
2130 IF TYPE=SRE THEN 2140 ELSE 2220
2140 A$="I ALREADY OWN THIS SQUARE"
2150 GOSUB 160
2160 ROW=23
2170 COL=3
2180 GOSUB 380
2190 FOR O=1 TO 500
2200 NEXT O
2210 GOTO 1370
2220 J=J-1
2230 IF J=8 THEN 2370
2240 CALL GCHAR(J,K,TYPE)
2250 IF RPT=2 THEN 2260 ELSE 2270
2260 IF TYPE=FLAG THEN 2370
2270 IF TYPE=SRE THEN 2290 ELSE 2310
2280 IF TYPE<129 THEN 2370
2290 RPT=RPT+1
2300 GOTO 2220
2310 IF TYPE<>FLAG THEN 2370
2320 IF Z=2 THEN 2330 ELSE 2340
2330 CALL VCHAR(J,K,FLAG,RPT)
2340 IF Y=2 THEN 2350 ELSE 2370
2350 S=S+RPT-1
2360 T=T+1
2370 J=ROW
2380 K=COL
2390 RPT=2
2400 J=J+1
2410 IF J=17 THEN 2560
2420 CALL GCHAR(J,K,TYPE)
2430 IF RPT=2 THEN 2440 ELSE 2450
2440 IF TYPE=FLAG THEN 2560
2450 IF TYPE=SRE THEN 2470 ELSE 2490
2460 IF TYPE<129 THEN 2560
2470 RPT=RPT+1
2480 GOTO 2400
2490 IF TYPE<>FLAG THEN 2560
2500 IF Z=2 THEN 2510 ELSE 2530
2510 J=ROW
2520 CALL VCHAR(J,K,FLAG,RPT)
2530 IF Y=2 THEN 2540 ELSE 2560
2540 S=S+RPT-1
2550 T=T+1
2560 J=ROW
2570 K=COL
2580 RPT=2
2590 K=K-1
2600 IF K=12 THEN 2740
2610 CALL GCHAR(J,K,TYPE)
2620 IF RPT=2 THEN 2630 ELSE 2640
2630 IF TYPE=FLAG THEN 2740
2640 IF TYPE=SRE THEN 2660 ELSE 2680
2650 IF TYPE<129 THEN 2740
2660 RPT=RPT+1
2670 GOTO 2590
2680 IF TYPE<>FLAG THEN 2740
2690 IF Z=2 THEN 2700 ELSE 2710
2700 CALL HCHAR(J,K,FLAG,RPT)
2710 IF Y=2 THEN 2720 ELSE 2740
2720 S=S+RPT-1
2730 T=T+1
2740 J=ROW
2750 K=COL
2760 RPT=2
2770 K=K+1
2780 IF K=21 THEN 2930
2790 CALL GCHAR(J,K,TYPE)
2800 IF RPT=2 THEN 2810 ELSE 2820
2810 IF TYPE=FLAG THEN 2930
2820 IF TYPE=SRE THEN 2840 ELSE 2860
2830 IF TYPE<129 THEN 2930
2840 RPT=RPT+1
2850 GOTO 2770
2860 IF TYPE<>FLAG THEN 2930
2870 IF Z=2 THEN 2880 ELSE 2900
2880 K=COL
2890 CALL HCHAR(J,K,FLAG,RPT)
2900 IF Y=2 THEN 2910 ELSE 2930
2910 S=S+RPT-1
2920 T=T+1
2930 J=ROW
2940 K=COL
2950 RPT=2
2960 J=J-1
2970 IF J=8 THEN 3170
2980 K=K+1
2990 IF K=21 THEN 3170
3000 CALL GCHAR(J,K,TYPE)
3010 IF RPT=2 THEN 3020 ELSE 3030
3020 IF TYPE=FLAG THEN 3170
3030 IF TYPE=SRE THEN 3050 ELSE 3070
3040 IF TYPE<129 THEN 3170
3050 RPT=RPT+1
3060 GOTO 2960
3070 IF TYPE<>FLAG THEN 3170
3080 IF Z=2 THEN 3090 ELSE 3140
3090 FOR F=1 TO RPT
3100 CALL HCHAR(J,K,FLAG)
3110 J=J+1
3120 K=K-1
3130 NEXT F
3140 IF Y=2 THEN 3150 ELSE 3170
3150 S=S+RPT-1
3160 T=T+1
3170 J=ROW
3180 K=COL
3190 RPT=2
3200 J=J+1
3210 IF J=17 THEN 3410
3220 K=K-1
3230 IF K=12 THEN 3410
3240 CALL GCHAR(J,K,TYPE)
3250 IF RPT=2 THEN 3260 ELSE 3270
3260 IF TYPE=FLAG THEN 3410
3270 IF TYPE=SRE THEN 3290 ELSE 3310
3280 IF TYPE<129 THEN 3410
3290 RPT=RPT+1
3300 GOTO 3200
3310 IF TYPE<>FLAG THEN 3410
3320 IF Z=2 THEN 3330 ELSE 3380
3330 FOR F=1 TO RPT
3340 CALL HCHAR(J,K,FLAG)
3350 J=J-1
3360 K=K+1
3370 NEXT F
3380 IF Y=2 THEN 3390 ELSE 3410
3390 S=S+RPT-1
3400 T=T+1
3410 J=ROW
3420 K=COL
3430 RPT=2
3440 J=J-1
3450 IF J=8 THEN 3650
3460 K=K-1
3470 IF K=12 THEN 3650
3480 CALL GCHAR(J,K,TYPE)
3490 IF RPT=2 THEN 3500 ELSE 3510
3500 IF TYPE=FLAG THEN 3650
3510 IF TYPE=SRE THEN 3530 ELSE 3550
3520 IF TYPE<129 THEN 3650
3530 RPT=RPT+1
3540 GOTO 3440
3550 IF TYPE<>FLAG THEN 3650
3560 IF Z=2 THEN 3570 ELSE 3620
3570 FOR F=1 TO RPT
3580 CALL HCHAR(J,K,FLAG)
3590 J=J+1
3600 K=K+1
3610 NEXT F
3620 IF Y=2 THEN 3630 ELSE 3650
3630 S=S+RPT-1
3640 T=T+1
3650 J=ROW
3660 K=COL
3670 RPT=2
3680 J=J+1
3690 IF J=17 THEN 3890
3700 K=K+1
3710 IF K=21 THEN 3890
3720 CALL GCHAR(J,K,TYPE)
3730 IF RPT=2 THEN 3740 ELSE 3750
3740 IF TYPE=FLAG THEN 3890
3750 IF TYPE=SRE THEN 3770 ELSE 3790
3760 IF TYPE<129 THEN 3890
3770 RPT=RPT+1
3780 GOTO 3680
3790 IF TYPE<>FLAG THEN 3890
3800 IF Z=2 THEN 3810 ELSE 3860
3810 FOR F=1 TO RPT
3820 CALL HCHAR(J,K,FLAG)
3830 J=J-1
3840 K=K-1
3850 NEXT F
3860 IF Y=2 THEN 3870 ELSE 3890
```







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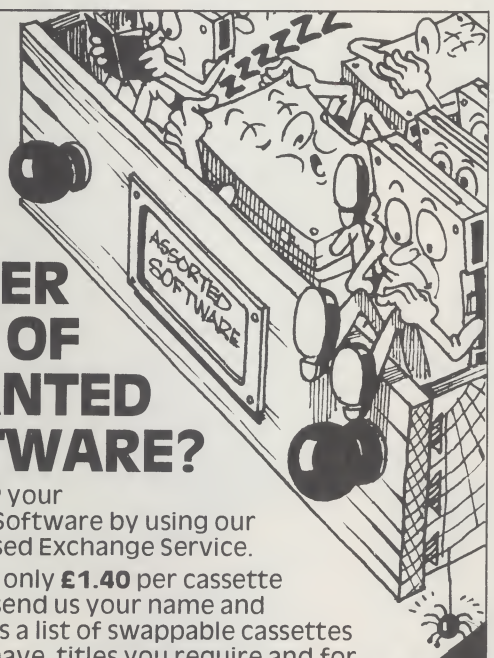
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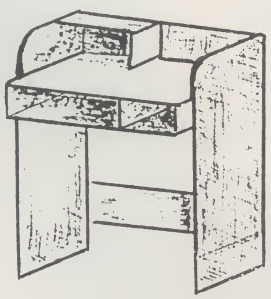
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WAR

So far in this series I have looked at the history of wargaming and the reasons for putting a wargame onto a computer in the first place. But now we start to get heavy with the maths.

Don't worry, I can assure you that the mathematics are simple enough for even me to understand, so I don't think you'll have any problem at all in understanding them. It is a common fallacy that to be a good programmer you need to have an in depth knowledge of mathemetics. It just ain't so, but a knowledge of how to add and subtract does help.

The Need For Random Numbers

Why do we need random numbers? In the design of any wargame you will find that giving predefined results to the choices presented to the player soon leads to a very boring game. This is exactly the opposite of adventure games where predefined answers are needed to guide the player to the inevitable conclusion of the game; the skill and interest comes from finding the answers.

In a wargame the player is presented with a conflict, and must do his best to ensure that the conflict comes



GAMES

out in his favour. His range of choices must be much greater and the level of certainty must be less in each choice. To pursue each possible choice to its conclusion would require a logical tree structure much greater than the present-day micro could contain. (It would probably stretch the capabilities of the largest mainframe computer). So uncertainty must be treated as randomness.

How To Use Random Numbers

Right, on to random numbers themselves. A random number is a number within a defined range that could not be predicted from what has gone before. On computers it is impossible to produce random numbers, but nearly all microcomputers have the facility to produce pseudo-random numbers. These are numbers which are very difficult to predict, so for practical purposes they are random.

Many micros use the operator RND (n) to produce a random number between one and the integer. On nearly all micros RND (0) will produce a random number between 0 and almost one. So to produce a random integer between one and six your formula will be as in Fig.1. Also in some micros there is a way to 'seed' the random number generator i.e. set it up to produce random numbers. By using the RND function in formula it is possible to produce ranges of random numbers which will be of use in programming a wargame. The best thing for you to do is check in your own computer's manual to find out how to generate random numbers.

The formula in Fig.1 will produce an equal chance for each number, one to six. However, there are ways to bias the distribution of numbers.

For instance, the formula in Fig.2 gives a bias towards numbers in the centre of the distribution: the number four is three times more likely to occur than the number one. The formula in Fig.3 gives a bias towards high numbers: the number five is nine times more likely to occur than the number one. Experiment with different distri-

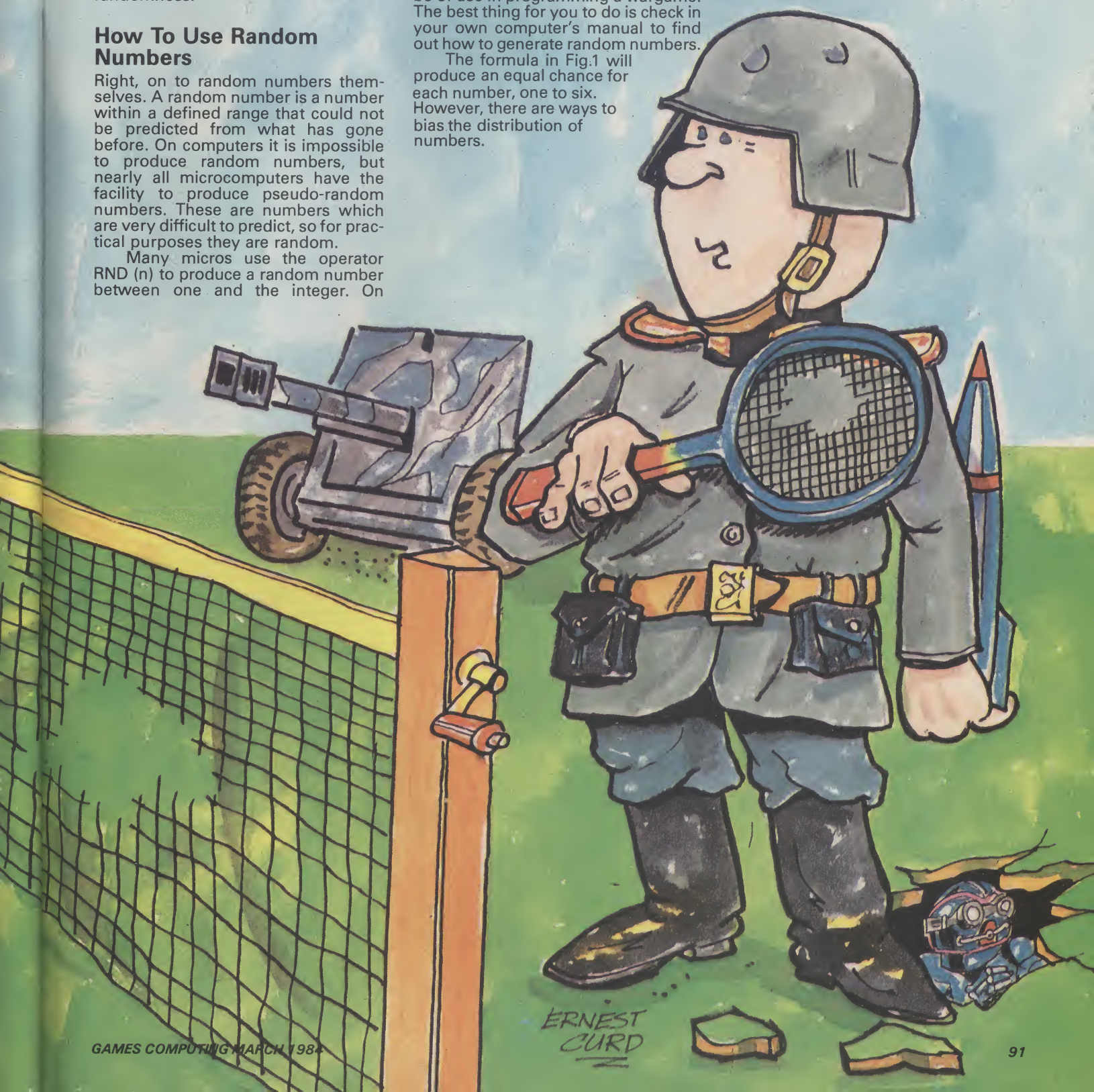
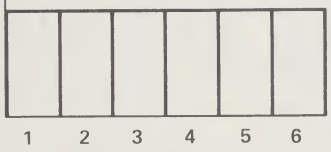
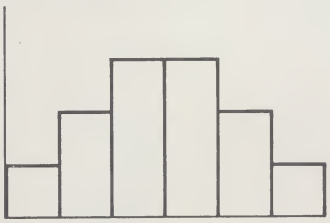


Diagram 1



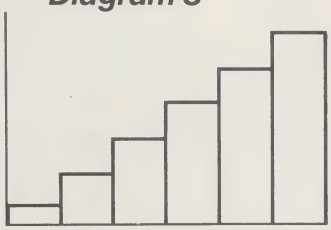
FORMULA. INT(RND(0)*6+1)

Diagram 2



FORMULA. INT((RND(0)+RND(0))*3+1)

Diagram 3



FORMULA: A = INT(RND(0)*631)
B = INT(RND(0)*631)
IF A<B THEN A = B

butions to get different effects: INT(RND(0) * 4 + RND(0) * 2 +L) will give a distribution similar to Fig.2, but with a centre. 1 — INT((RND(0) + RND(0)) * 3 + 1) gives greater chance to higher and lower numbers than to middle-range numbers. In the example given I have restricted it only to formulae providing numbers between one and six.

There is no reason not to use a range of one to 10, or 56 to 97 — any range is possible. Program One gives an opportunity to try out different formulae to find out what their distributions are.

Wargame Usage

So that's the basics of random numbers. How are they used in wargames?

The first use is to give random results in battles, a use common to many wargames. For intance, in a battle the losses for each side could be calculated as:

own strength — enemy's strength
X INT(RND(0) * 30 + 1)/100.

This particular formula allows a large force to have a greater chance of winning against a smaller opponent than of losing, but doesn't give certainty.

The other main use for random numbers is to control a computer opponent. The creation of a capable computer opponent is a large subject by itself, and I shall try to cover the principles here, and show how random numbers play their part.

A computer opponent must behave in a sensible way and aim for victory over the human player. To do this it must have clear objectives. This means that not only must there be a way for the computer to achieve victory, but there must also be a path by which it can achieve that victory. The computer must be able to react to the actions of the player in such a way that its overall strategy is logical.

```
 10 PRINT "what is the lowest
number in the range"
 20 INPUT ml
 30 PRINT "what is the highest
number in   the range"
 40 INPUT mh
 50 LET mr=mh-ml+1
 60 DIM r(mr)
 70 FOR l=1 TO mr
 80 LET r(l)=0
 90 NEXT l
100 LET mv=mr*mr
110 FOR l=1 TO mv
120 REM a=random number formula
130 REM eg if distribution is as
figure 1
140 REM and range is 11 to
17 then:
150 LET a=INT (RND*mr+ml)
160 REM where ml is 11 and mh
is 17
200 LET ax=a-ml+1
210 LET r(ax)=r(ax)+1
220 NEXT l
230 PRINT "distribution result"
240 PRINT "number","occurrences"
250 FOR i=1 TO mr
260 LET ax=l+ml-1
270 PRINT ax,r(l)
280 NEXT l
300 STOP
```

So you must set out clearly before you start what are the computer objectives. For an example, let us take a simple wargame; two armies are at opposite ends of a game board, a city lies midway between; the winner is the army that occupies the city for three consecutive turns.

Obviously, the main objective for the computer is to occupy the city for three turns. But there are a whole host of other objectives. The player must be stopped from occupying the city for three turns, the computer must move fast enough to gain control of the centre of the board, but must maintain cohesion between its different units. Then there are local objectives, depending on the status of the battle. Units must not be moved into exposed positions if possible; units must be positioned in such a way as to allow local pressure to be brought to bear either to capture the city (the main objective) or to weaken the player's forces (a secondary objective). But most important, the computer must not be predictable.

Looking at the control of the computer's movement we should end up with a logical structure something like the following:

1. If the city is within reach and empty, and if total friendly strength next to the city is greater than total enemy strength next to the city, then occupy the city.
2. If the city is within reach and enemy occupied then move next to the city.
3. If there is a friendly force within reach then move next to it, as close to the city as possible.
4. Move in a random direction, with 50% chance towards the city, 10% chance away from it, 20% chance parallel to the city in each direction.

This structure ignores the need to deal with enemy units, and can lead to units being places in exposed positions, but as a basis for a computer opponent moves sensibly it has potential.

In the above article I have looked at randomness and generating computer opponents. In next month's spotlight on wargames I will look at more items which come into wargame design — defining the game, testing the design and data storage techniques.

MILITARY REVIEW

Johnny Reb

Published by Lothlorien for the Spectrum, BBC B and Oric 48K. Price: £5.50 (Spectrum), £6.95 (others).

Johnny Reb is a wargame set in the American Civil War. It revolves round a generalised battle of the period concerned with the capture of a river crossing.

The game loads behind a front page showing the flurry of the Confederacy. It begins with a question and answer session to determine who plays and what forces are to be used. The game provides the option of two players, or one player against the computer with the player choosing to play either the Confederacy or the Union. The forces chosen can consist of up to 20 infantry, up to 20 cavalry and 20 artillery. In practice there is no point in choosing more than five artillery units because ammunition is rationed.

When the forces have been chosen the game map is drawn. This is always appropriately the same — a river flows centrally down a field with a bridge crossing it and a forest is located on the right bank. The player's forces are set up on the right bank and the computer's forces (or other player's forces) set up on the other bank. The winner is the first to reach the enemy's command post with three of his units. In practice elimination of the enemy is a more common occurence.

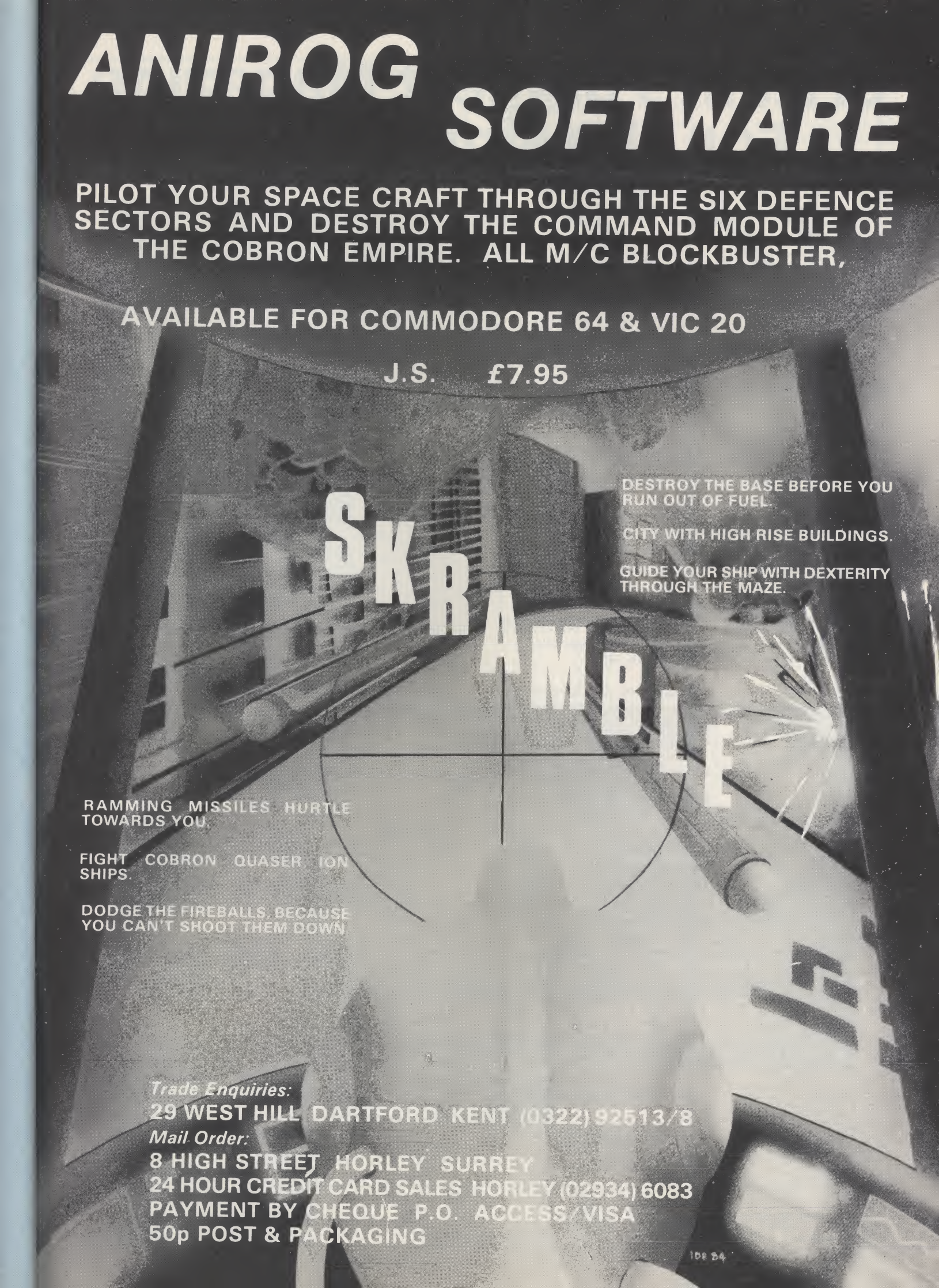
The game plays fairly well, but the computer does not provide a very strong opponent. It tends to gather its forces towards the bridge where artillery can wreak havoc on the massed forces. This highlights another problem in the game: the artillery is incredibly powerful, which is unhistorical; it is also invariably accurate. The way to win the game is to hold off from crossing the river until the opponent has been defeated on your side of the river. In a two player game this leads to a virtual stalemate with a desultory artillery duel; in a player versus computer game the computer can be defeated using this tactic as it will always attempt to storm across the bridge.

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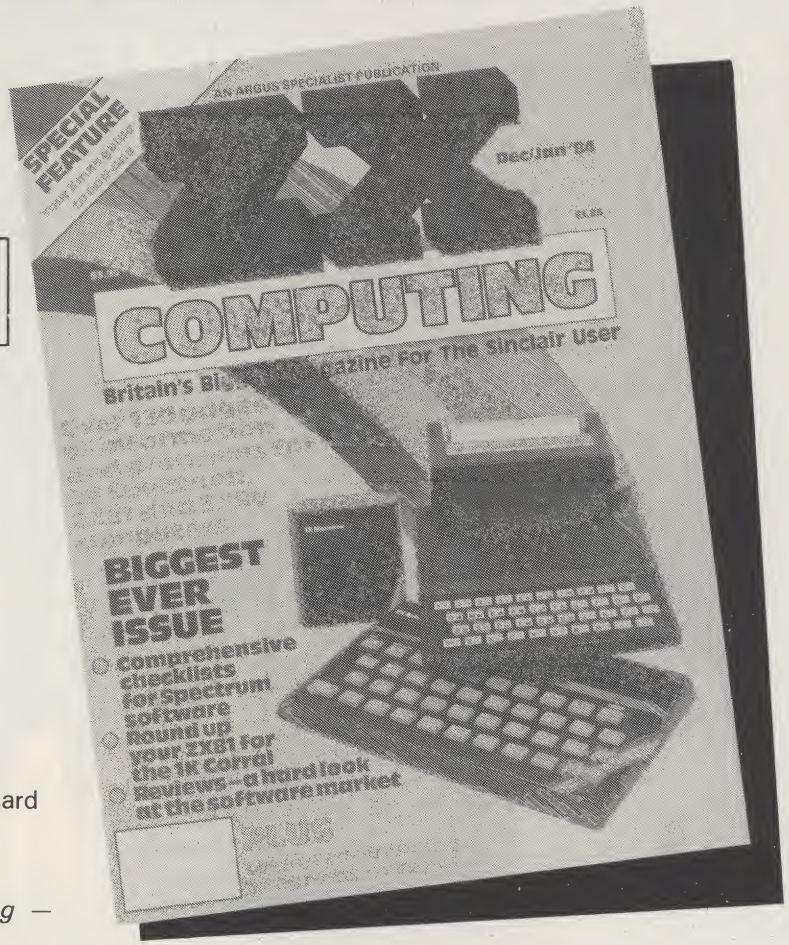
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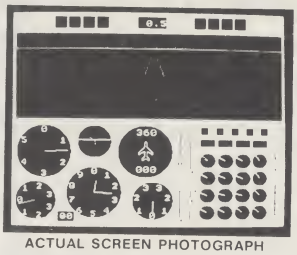
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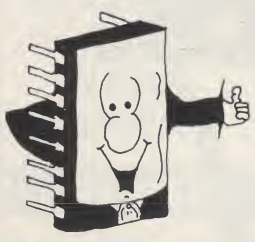
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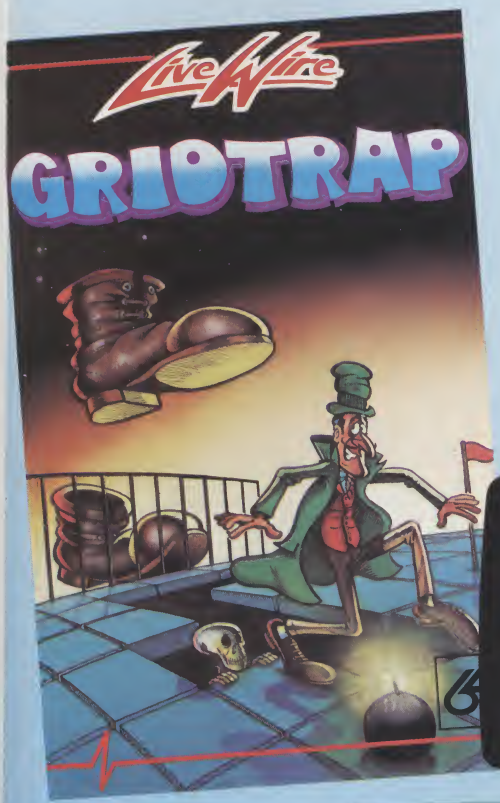
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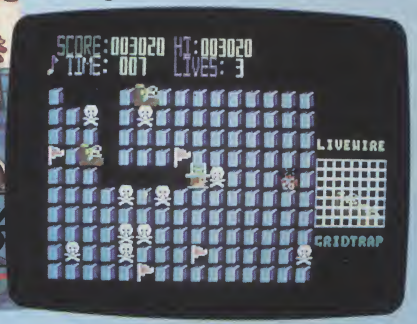


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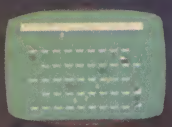
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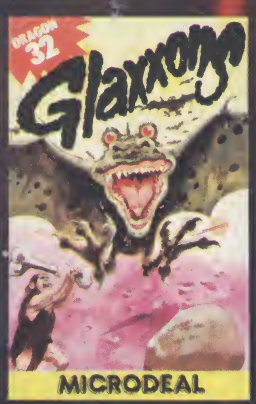


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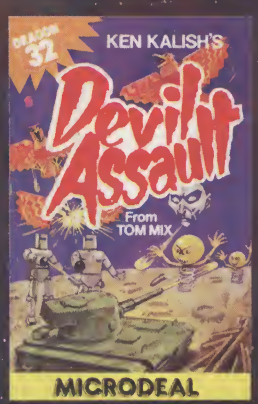
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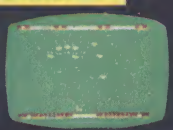






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